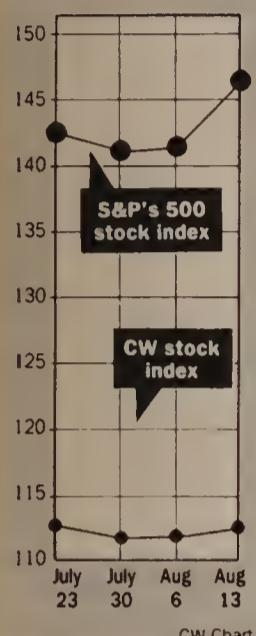


COMPUTERWORLD

\$2/COPY; \$44/YEAR

AUGUST 18, 1986

VOL. XX, NO. 33

Stock update

Stock charts in full, page 109

Executive Roundtable

MIS answers end users/41

In Depth

The merging of computer and telecom operations/59

TOP OF THE NEWS

Pledging major resources to help market Dbase Mac, Apple stands with Ashton-Tate. **Page 10.**

Attempting to address financial woes, Convergent Technologies axes 25% of its staff, cuts executive salaries. **Page 108.**

Burroughs bridges workstations and resource processors to Disoss. **Page 14.**

Turbo versions of Apollo's engineering workstations debut. **Page 6.**

Floating Point Systems moves its mini-supercomputers from the computer room to the office environment. **Page 37.**

Ashton-Tate's Aug. 19 corporate pricing announcement is scheduled to include charges for a technical support hot line, technical newsletters and provisions for the removal of copy protection for large customers. Unlike Lotus's recently announced plan, Ashton-Tate will not sell direct to corporations. The firm will not offer site licensing. All existing products, including Dbase Mac, will be immediately covered by the plan, sources said.

Adding more confusion to IBM's mid-range strategy, an IBM observer claims officials in IBM's Marketing Assistance Program revealed that the IBM 4300 family — small mainframes and minicomputers that have been key elements of

See NEWS page 7

Coming this week:**FOCUS**

Unix operating system trends and issues will be targeted in *Computerworld Focus*, due out Aug. 20. *Focus* will analyze the Unix marketplace, explore leading product implementations, probe the MS-DOS/Unix connection and talk to users who have taken the Unix plunge.

Military acts to speed OSI

DOD push for tools to cut costs spurs development

By Elisabeth Horwitt

A Department of Defense cost-cutting mandate for its divisions to buy off-the-shelf communications systems will spur rapid commercial availability of Open Systems Interconnect (OSI) connectivity tools, observers say.

The department is supporting private-sector development of commercial OSI products in order to save military organizations from having to duplicate that work internally using proprietary protocols. "We want to avoid reinventing the wheel," says Rhoda Mancher, associate director of information resource management for the Naval Operations Systems Division.

See MILITARY page 4

IBM recovery system delayed

By Charles Babcock

RYE BROOK, N.Y. — An important IBM recovery product for large-scale data base management systems has run into testing snags and may be as much as a year away from general availability.

IBM first acknowledged the delay in an unusual statement earlier this month in which it confirmed product difficulties and said general availability had been rescheduled, but it did not specify a release date. The product, called Extended Recovery Facility, was designed to provide an instantaneous backup to IBM's widely installed IMS data base management

See IBM page 12

Largest users win Lotus concessions

By Douglas Barney

CAMBRIDGE, Mass. — Major corporations received a long-awaited and much-demanded concession from Lotus Development Corp. last week, with the firm at least partially acceding to user demands for site licensing and volume purchase programs on its popular software.

Promising it will be Lotus's major announcement for 1986, company Chairman Jim Manzi said the plan "establishes a new kind of relationship between us and our customers." The program, however, drew a mixed reaction because it only provides direct sales and free high-level support to the very largest Lotus customers.

Called the Multi-Value Plan, the program offers a variety of purchasing and distribution options and provides a means for the elimination of copy protection (see story page 8). The bulk of the programs that make up MVP are currently available.

One element, Lotus's Corporate Access, provides direct sales only to firms that order 500 or more packages that are sent to a single location. These sales can be made through the Special Bids program, under which the firm negotiates a price with Lotus and receives the contracted number of packages, or through the Electronic Distribution program, under which users can download the software from their mainframe.

"If you believe that MIS/DP is taking over more control, by nature MIS/DP likes to deal with vendors directly," said Stephen J. Crummey, vice-president of sales and service for Lotus. So far, 23 firms have signed up for the Special Bids program.

Those customers seeking the removal of copy protection must have an officer of the company sign a written contract stating that the firm has a policy prohib-

See LARGEST page 8

CW INSIGHT

Gates talks: The 386 machines, a new MS-DOS and beyond

By Douglas Barney

Microsoft Corp. Chairman and MS-DOS crusader Bill Gates is not afraid to stick his neck out. He announced the development of a product called Windows when it was but a gleam in a programmer's eye and personal computers lacked the power to even run such a product effectively.

But Gates pressed on and is finally beginning to see his faith in Windows bear fruit. Three years after the original announcement, Lotus Development Corp. has promised to develop for Windows, and Ashton-Tate has given a cautious endorsement.

Now, Gates, who says he will not rest until he sees a microcomputer on every

desktop, has shifted his attention to the development of a new version of MS-DOS. Due in 1987 at the latest, the upgrade will unlock the immense address space of the latest generation of micros based on Intel Corp.'s 80286 chip, as well as that of the still-to-come 80386 machines.

Gates sat down with *Computerworld* in Boston last week and spoke about the new MS-DOS, his microcomputer software competition, Microsoft's ties to key software developers and his tips for personal computer buyers.

CW: Should corporations buy 286-based



Chairman Gates

machines today, or wait until 386 machines are available later in the year?

GATES: First, we've been encouraging people not to buy 8088-based machines. They're going to run out of gas on a performance basis alone, not to mention the memory address space problem. I think the 286 machines have the performance, and with the right version of DOS, they have the 16M bytes, so people should feel pretty good about having a 286.

CW: And the 386?

GATES: It's even better. When these machines finally come out, users will have

See GATES page 6

NEWS

Sluggish NCC forces AFIPS layoffs, donation cutbacks

By David A. Ludlum

RESTON, Va. — Stung by disappointing attendance at its National Computer Conference this year, the American Federation of Information Processing Societies (AFIPS) is laying off approximately one-half its headquarters staff. The cutbacks will leave AFIPS with a staff of 25, down from approximately 50 earlier this year, federation President Jack Moshman said last week.

AFIPS is also halting its charitable donations to such institutions as the Boston Computer Museum; *Computer Chronicles*, a public television program; and the Charles Babbage Institute, a computer archive at the University of Minnesota.

AFIPS is a nonprofit federation of 11 computer users organizations, including the Data Processing Management Association, Association for Computing Machinery and the Computer Society of the Institute of Electrical and Electronic Engineers.

While unexpectedly slack attendance at the 1986 NCC, held in Las Vegas in June, has presented AFIPS with a budget crisis, the group is not cutting back on support staff for NCC or for its NCC Telecommunications Conference, to be held in Philadelphia next month, Moshman said.

"NCC absolutely is not going to be reduced in importance. We look for telecommunications to be an important and growing part" of AFIPS' activities, he said.

AFIPS has reduced its conference support staff slightly because of the federation's abandonment earlier

this year of the annual Office Automation Conference, the other major gathering AFIPS had sponsored, Moshman said.

The federation also will not cut back staff for its publishing division, which issues proceedings of conferences, monographs and computer-related subjects; its Washington, D.C., office, which provides information on trends in technology for legislators and other government officials; or support for the International Federation of Information Processing Societies, according to Moshman.

AFIPS had donated roughly \$100,000 a year to *Computer Chronicles* and provided "fairly sizable [advisory] staff backup" for the show, Moshman said.

AFIPS budgets operations on the basis of projected attendance at its major conferences, which generate most of the income and tend to come late in its fiscal year, Moshman said.

"We were frankly surprised this year at the reduction. We don't have all the numbers yet. From head counts and so on, we know it is less than we thought it would be," Moshman said of attendance during the current fiscal year.

He declined to provide estimates of federation revenue or the decline this year from 1985. He said the drop-off was "enough to make us sit up and take notice."

The layoffs and cutbacks stem from the federation's conservative estimate of its revenue for the upcoming fiscal year, which begins Oct. 1, Moshman said.

WIDE WORLD PHOTO



End of an era

The U.S. Navy lifted its cap to Rear Adm. Grace M. Hopper last week when the 79-year-old codeveloper of Cobol retired in ceremonies aboard the 188-year-old USS Constitution in Boston. Hopper, who had been retained on active duty since reaching official retirement age, was presented the Distinguished Service Medal by Navy Secretary John F. Lehman Jr.

In this issue

NEWS

Workstation market blitzed by replacement models, enhancements, price cuts and software/ 6

Product repositioning has little initial impact on workstation market/ 7

HP software pushes minicomputer OA functions down to PCs/ 8

DBMS package for Apple's Macintosh out from Ashton-Tate/ 10

Microsoft's Macworks, third-party vendor wares unveiled at the Macworld Expo/ 12

Burroughs' IBM compatibility commitment reinforced by trio of products/ 14



Page 59

DG pleads strategic delay in MV20000 upgrade/ 14

Corporate users unimpressed by IBM PC direct sales price cuts/ 15

COMMUNICATIONS

Divested Bell operating companies' wiring scheme rivals those of IBM, AT&T/ 19

Recently announced network management systems target major and entry-level users/ 19

Expanded multiplexer and variable-speed modem out from Micom/ 19

MICROCOMPUTERS

White-collar productivity gauged by software/ 23

Steven Jobs' Next finds outlet for Apple-compatible software/ 23

IBM to support 33 additional non-Blue products/ 23

SOFTWARE & SERVICES

Expert system shell growth and use described by Hayes-Roths/ 33

SYSTEMS & PERIPHERALS

Southland reports early-user experience with Amdahl mainframe verifies vendor's claims/ 37

Control Data introduces 32-bit array processor for attachment to Cyber 180 line/ 37

Floating Point Systems supplements minisupercomputer product line/ 37

MANAGEMENT

U.S. West aims to improve 14-state interoffice communications by linking IBM, DEC and Wang systems/ 67

In-house vendor expos help busy info systems managers keep abreast of technology/ 67

COMPUTER INDUSTRY

McCormack & Dodge reorganizes, attempts an independent business unit concept/ 86

Chip industry inching toward an upswing/ 110

Burroughs/Sperry disclose postmerger executive lineup/ 110

FAA to halt purchase of Paradyne data communications equipment/ 118

EXECUTIVE ROUNDTABLE

End-user computing issues: As demands increase, MIS must find ways to meet their call. Four corporate information systems managers tell *Computerworld* about their innovative solutions. By Glenn Rifkin/ 41

IN DEPTH

Making skills meet: The eventual union of corporate DP and telecom departments will require specialists with operational and technical expertise. The time to develop these hybrid workers is now. By Peter G. W. Keen/ 59

OPINION & ANALYSIS

Newquist on neural networking/ 17

Ulrich on overcoming resistance to innovation/ 19

McEnaney on the practicality of CD-ROM/ 23

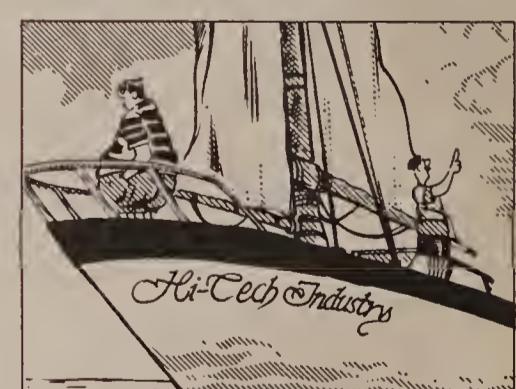
Hightsmith on improving software development/ 33

Raimondi on the summer activity of vendors/ 37

Betts and Ludlum probe credibility of a federal study on VDT use by pregnant women/ 67

Wilder on latest U.S.-Japan trade agreement/ 110

DEPARTMENTS



Page 16

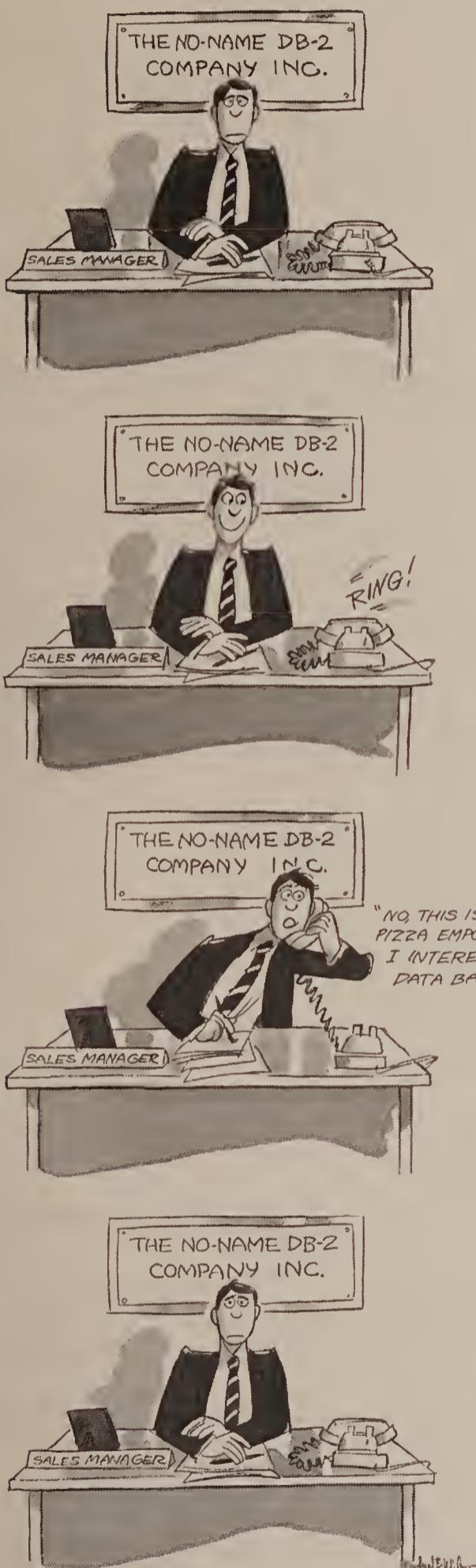
World Digest/ 15

Editorial/ 16

Calendar/ 72

New Products/ 75

IF ANYONE BUT IBM WAS SELLING DB2, WHO WOULD BUY IT?



Not many people. But the fact is, IBM is selling DB2. And IBM seems a safe choice. So a lot of people are willing to put up with DB2's shortcomings with the idea that IBM will eventually correct those flaws.

But instead of buying a data base management system (DBMS) that may satisfy your company's needs some day, doesn't it make more sense to buy a DBMS that can satisfy your company's needs today?

Which is precisely the reason why so many companies buy ADR/DATACOM/DB®, our high performance relational DBMS, instead of DB2.

You see, the company that buys ADR/DATACOM/DB gets a complete system. One with an active, integrated data dictionary that defines data, controls data and protects data. Automatically. The DB2 buyer doesn't get one. And no one is sure if they ever will.

The ADR® buyer can get ADR/IDEAL®, our 4th generation application development system. A system that helps reduce the applications backlog by increasing productivity. The DB2 buyer can't. They're stuck with 3rd generation systems.

The ADR buyer can also get migration software. Software that lets them convert without the ordeal of rewriting all their applications. The DB2 buyer can't. They have to rewrite every last one of them.

The ADR buyer can network their DBMS. They can distribute their data bases across multiple sites. The DB2 buyer can't. The site they buy is the only site they get.

And, most important of all, the ADR buyer gets a high performance relational DBMS. A DBMS that delivers the flexibility end-users need as well as the performance production demands. Unfortunately, the DB2 buyer doesn't.

All of which makes you wonder, if the ADR/DATACOM/DB buyer can get all these things and the DB2 buyer can't, why would anyone want to buy DB2 at all?

For more about what you can expect as an ADR/DATACOM/DB buyer, mail us the coupon. Or call 1-800-ADR-WARE.

ADR WE KEEP WRITING THE HISTORY OF SOFTWARE
AN AMERITECH COMPANY

Applied Data Research.® Orchard Road & Rt. 206, CN-8, Princeton, NJ 08540 1-800-ADR-WARE. In NJ, 1-201-874-9000.

Please send me more information about ADR/DATACOM/DB.
 Please have an ADR® Representative call.

Name _____ Position _____

Company _____ Phone _____

Address _____

City _____ State _____ Zip _____

Computer Equipment _____

CW8/18/86

For information about ADR Seminars call 1-800-ADR-WARE.

IBM and DB2 are trademarks of the International Business Machines Corp.

© 1986 ADR

NEWS

Military acts to speed OSI

From page 1

Historically, the DOD has used Transmission Control Protocol/Internet Protocol (TCP/IP), a set of communications protocols developed specifically for military networks. A 1985 report jointly produced by the DOD and the National Bureau of Standards (NBS) estimated that buying off-the-shelf OSI products would be between 30% and 80% less expensive for the military than if it developed its own equivalent TCP/IP products.

The military also favors standards such as OSI and Integrated Services Digital Network (ISDN), because these would provide a common interface between Defense Data Network sites in the U.S. and overseas. The two standards are gaining support from a growing number of foreign businesses as well as international bodies, such as the North American Treaty Organization, which has announced support for OSI.

According to Mancher, various divisions of the armed forces only recently began looking for a viable internetworking standard, because they are beginning to hook up their own largely autonomous communications systems to the Defense Data Network. "We don't want a strategy that will be out of date by the time we implement it. Frankly, we need an effective way to link ISDN before we're really ready to fight World War III," she says.

"Everyone wants to see the DOD convert to OSI," says John Haefner, chief of the NBS's systems and network architecture division. "But in order for them to maintain operations during the five to seven-year conversion period, they need gateways between the new OSI systems and their current systems that use TCP/IP."

Hence, military-funded development of OSI gateways will also be of use to private-sector users who have been using TCP/IP. This standard, the military's current de facto standard, is also the closest thing to a multivendor networking system that

is currently available.

While it has not yet committed to phasing out TCP/IP completely, the DOD has decided to use the OSI standards, currently being developed by the International Standards Organization (ISO), "whenever international standards are available and can be used to support military requirements," Assistant Secretary of Defense Donald Latham said in an official statement more than a year ago.

Latham's directive reflects the U.S. military's realization that OSI, not TCP/IP, will become the international communications standard. The recent surge of TCP/IP product introductions "is a trickle compared with what computer vendors are doing behind the scenes with OSI," according to Haefner. "The new TCP/IP products are primarily bids from smaller companies for a niche in the DOD market. In contrast, vendors are implementing OSI across the board.

The Defense Communications Agency, the NBS, IBM and other vendors who are part of the OSInet project [CW, Aug. 11] are jointly funding the developing application-level gateways between OSI and TCP/IP as well as systems to test the gateways' performance. The tests will be run on OSInet, a prototype network currently being created by an alliance of 25 vendor and user organizations.

One gateway, which DEC reportedly is working on, will link the DOD's electronic mail protocol, Simple Message Transfer Protocol, with the equivalent OSI protocol, X.400. Similar projects will produce gateways between the military's File Transfer Protocol and OSI's File Transfer Access Method and between the military's Telnet and OSI's Virtual Terminal Protocol. These bridges should be available within the next 18 months, a DOD spokesman said.

The Naval Data Automation Command is working with the NBS on a performance testing system for OSI directory services protocols, which still have to be agreed on by the CCITT and ISO and finalized at an NBS implementation workshop. The directory services, which translate names to addresses for routing purposes, are "extremely important for organizations like the U.S. Navy who have to link up local networks to networks overseas," Mancher says.

The U.S. Air Force is working with the NBS to come up with OSI network management specifications,

"which are currently not very far along or right, we feel," NBS's Haefner says. "Rather than wave our arms, we are looking at how network management is performed by existing systems such as IBM's Systems Network Architecture and the Defense Data Network."

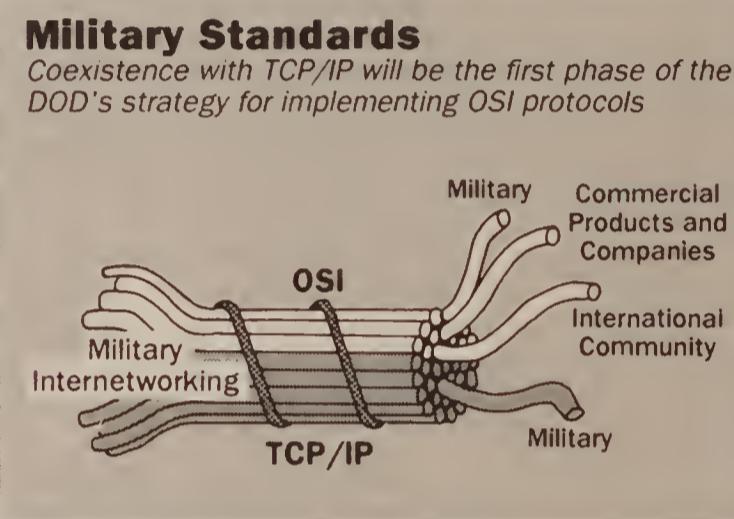
Defining specifications

Finally, the DOD is in the process of defining Military Specification Supplements that define which options and subsets of OSI protocols are best suited to its needs.

"The ISO protocols can be characterized as having many optional features and user requirements," says Martin A. Thompson, associate director for the DCA Interoperability and Standards Office. "It must be emphasized that the objective is not to create DOD-unique versions of commercial protocols, but to define an options set."

The Defense Data Network already conforms to the bottom three OSI layers, but it is only recently that the upper layers have solidified enough for the DOD to begin evaluating their potential in military internetworking. As recently as last year, the DOD's Latham noted that Transport Protocol-4 — the furthest along of the upper four layers of the OSI model — was then unavailable "as a proven commercial offering."

Military communications organizations such as the DCA and the Naval Data Automation Command — both of which became charter members of OSInet earlier this month — have since taken an expanding role in monitoring and accelerating the industry's progress toward viable commercial OSI products. Users should begin to feel the effect of this participation before too long.



Even the DOD hasn't got a big enough stick to get that kind of support for TCP/IP."

Haefner predicted that, while it may take 20 years for OSI to reach the same kind of functionality as proprietary network systems like Digital Equipment Corp.'s Decnet and IBM's Systems Network Architecture, "enough of OSI will be in place for useful products to become available by next year."

The DOD's participation will certainly accelerate this trend, Haefner claims. The fruits of recently initiated projects, jointly funded by computer vendors, the NBS and various military organizations, "will certainly be made available to commercial users," he says. The following efforts are among those currently underway.

"which are currently not very far along or right, we feel," NBS's Haefner says. "Rather than wave our arms, we are looking at how network management is performed by existing systems such as IBM's Systems Network Architecture and the Defense Data Network."

Defining specifications

Finally, the DOD is in the process of defining Military Specification Supplements that define which options and subsets of OSI protocols are best suited to its needs.

"The ISO protocols can be characterized as having many optional features and user requirements," says Martin A. Thompson, associate director for the DCA Interoperability and Standards Office. "It must be emphasized that the objective is not to create DOD-unique versions of commercial protocols, but to define an options set."

The Defense Data Network already conforms to the bottom three OSI layers, but it is only recently that the upper layers have solidified enough for the DOD to begin evaluating their potential in military internetworking. As recently as last year, the DOD's Latham noted that Transport Protocol-4 — the furthest along of the upper four layers of the OSI model — was then unavailable "as a proven commercial offering."

Military communications organizations such as the DCA and the Naval Data Automation Command — both of which became charter members of OSInet earlier this month — have since taken an expanding role in monitoring and accelerating the industry's progress toward viable commercial OSI products. Users should begin to feel the effect of this participation before too long.

COMPUTERWORLD

Publisher
Donald E. Fagan

Editor in Chief
Terry Catchpole

Executive Editor
Sharon Frederick

News Director
Peter Bartolik

Senior Editors

James Connolly, Systems
Clinton Wilder, Industry

Elisabeth Horwitz, Communications
Charles Babcock, Software

David Ludum, Management
Douglas Barney, Microcomputers

Senior Writers

Donna Raimondi
Rosemary Hamilton

Eddy Goldberg
Stanley Gibson

David Bright

New Products Editor
Suzanne Weixel

Intern
Susette Burton

Features Director
George Harrar

Senior Editors

Janet Fidrio
Glen Rikin

Barbara Wierzbicki

Associate Editors

Amy Sommerfeld Fiore
Becky Batcha

Assistant Editor
Deborah Fickling

Senior Writer

Michael L. Sullivan-Trainor

Managing Editor
Donovan White

Chief Copy Editor
Charlotte Ziems Donaldson

Assistant Chief Copy Editor
Patricia Heil Erickson

Copy Editors

Julie Cook
Penny Janzen

Susan Miller
Kelly Shea

Steven M. Ulfelder
David W. Bromley

Mary Grover

Design Editor
Marjorie Magowan

Graphics Editor
Mitchell J. Hayes

Graphic Designer
P. Charles Ladouceur

Graphics Assistant
Jeff Babineau

Assistant to the Editor in Chief
Parth Domke

Editorial Assistants

Patricia Faherty

Christie Sears

Linda Gorgone

Laura Fredrickson

Rights and Permissions Manager
Nancy Shannon

News Bureaus

Mid-Atlantic
201/967-1350

Alan Alper, Correspondent

Washington, D.C.
202/347-6718

Mitch Betts, Correspondent

Southeast
404/394-0758

James A. Martin, Correspondent

West Coast
415/328-8064

Jeffry Beeler, Chief

Maura McEnaney, Correspondent

Peggy Watt, Correspondent

Computerworld International News Service

Susan Blakeney, Director

Edward Warner, Editor

Main Editorial Office

Box 9171, 375 Cochituate Road,
Framingham, MA 01701-9171 617/879-0700

Computerworld is a member of the CW Communications Inc. group, the world's largest publisher of computer-related information. The group publishes over 50 computer publications in more than 20 major countries. Nine million people read one or more of the group's publications each month. Members of the CWCI group contribute to the Computerworld News Service, a daily on-line service offering the latest on domestic and international computer news. Members of the group include: ARGENTINA'S Computerworld Argentina; ASIA'S Asian Computerworld, AUSTRALIA'S Computerworld Australia, Australian PC World and Macworld; BRAZIL'S DataNews, and PC Mundo; CHINA'S China Computerworld and China Computerworld Monthly; DENMARK'S Computerworld/Danmark, PC World and Run (Commodore); FINLAND'S Mikro; FRANCE'S Le Monde Informatique, Golden (Apple), OPC (IBM), Théorie et Distributique; GERMANY'S Computerwoche, InfoWorld, PC Welt, Computer Business, and Run; ITALY'S Computerworld Italia and PC Magazine; JAPAN'S Computerworld Japan, MEXICO'S Computerworld Mexico, THE NETHERLAND'S Computerworld Netherlands and PC World; NORWAY'S Computerworld Norge and PC Mikodata; SPAIN'S Computerworld España, PC World and Commodore World; SWEDEN'S ComputerSweden, Mikrodatorn, and Svenska PC World; SWITZERLAND'S Computerworld Schweiz; THE UNITED KINGDOM'S Computer News, PC Business World, and Computer Business; VENEZUELA'S Computerworld Venezuela; the U.S. Amiga World, Computerworld, inCider, InfoWorld, MacWorld, MicroMarketWorld, PC World, Run, 73 Magazine, 80 Micro, Focus Publications and Network World.

Second-class postage paid at Framingham, Mass., and additional mailing offices. Computerworld (ISSN-0010-4841) is published weekly, except: January (5 issues), February (5 issues), March (6 issues), April (5 issues), May (5 issues), July (5 issues), August (5 issues), September (6 issues), October (5 issues), November (5 issues), and a single combined issue for the last week in December and the first week in January by CW Communications Inc., 375 Cochituate Road, Box 9171, Framingham, Mass. 01701-9171.

Copyright 1986 by CW Communications Inc. All rights reserved.

Computerworld can be purchased on 35 mm microfilm through University Microfilm Int. Periodical Entry Dept., 300 Zeeb Road, Ann Arbor, Mich. 48106. Computerworld is indexed: write to Circulation Dept. for subscription information.

PHOTOCOPY RIGHTS: permission to photocopy for internal or personal use or the internal or personal use of specific clients is granted by CW Communications Inc. for libraries and other users registered with the Copyright Clearance Center (CCC), provided that the base fee of \$3.00 per copy of the article, plus \$.50 per page is paid directly to Copyright Clearance Center, 21 Congress Street, Salem, Mass. 01970.

Permission to photocopy does not extend to contributed articles followed by this symbol. #

Special requests for reprints and permissions only should be addressed to Nancy M. Shannon, CW Communications Inc., 375 Cochituate Road, Box 9171, Framingham, Mass. 01701-9171. Subscriptions call toll free (800) 544-3712 or (215) 768-0388 in Pennsylvania.

Subscriber rates: \$2.00 a copy; U.S. — \$44 a year; Canada, Central & So. America — \$110 a year; Europe — \$165 a year. all other countries — \$245 a year (airmail service). Four weeks notice is required for change of address. Allow six weeks for new subscription service to begin.



ABP

POSTMASTER: Send Form 3579 (Change of Address) to Computerworld, Circulation Department, P.O. Box 1016, Southeastern, PA 19398-9984.

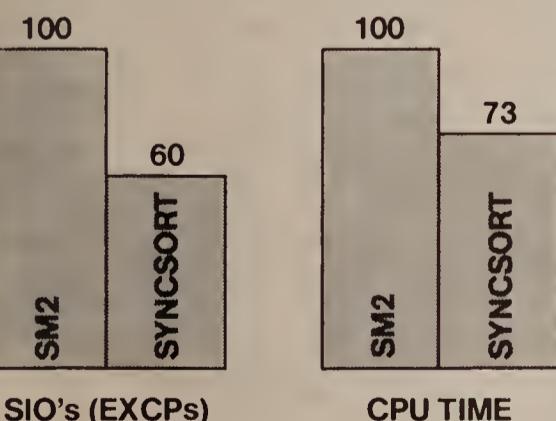
SMART COOKIE

Like you,
SyncSort DOS
is cut from
a special mold.

Call (201) 930-9700.

It's healthy
for your
system.

SyncSort DOS vs. SM2



One thing about smart cookies, they can spot each other a mile away.

While they don't flaunt their derring-do, they quietly know they're the best at what they do. Because substance shows through. Every time.

Especially when the going gets tough. And rough. As it often does in a DOS environment.

For example, a smart cookie doesn't crumble under the pressure of too many programs and too few programmers.

A smart cookie doesn't waste dough — but picks and chooses the right ingredient to keep production on the rise.

And sometimes, even, a smart cookie has to be a mighty tough cookie. That means being on the job constantly. Keeping things running and humming. Without draining vital resources.

All of which brings us to our smart cookie: SyncSort DOS. A cut above the rest if you ever saw one. Check these delicious advantages.

BETTER PERFORMANCE

Pop one into your system and you'll see a mouthwatering difference. Immediately. SyncSort DOS will give you performance improvements like those shown in the chart on the left.

And performance features such as:

- **Automatic Secondary Allocation** — With this feature your sorts will never run out of disk space, i.e., no "sort capacity exceeded" messages.

BETTER FEATURES TO IMPROVE PROGRAMMER PRODUCTIVITY

As you begin to digest SyncSort DOS, you'll find it more and more to your liking. With ingredients that cut down to size the amount of programming time going into applications.

- **SortWriter** — A powerful tool that can produce extensive reports as a by-product of your normal sorting — without user exits and the associated programmer investment. Headers, trailers, total and sub-total capabilities provide flexible formatting.
- **Record Formatting** — Powerful features like INCLUDE/OMIT, INREC/OUTREC, SUM and others — with capabilities like data conversion, editing, insertion of literals.
- **Multiple Output** — From a single sorted file, you can create multiple files and reports. Each can include the same or different data as determined by INCLUDE, OMIT, OUTFIL or OUTREC parameters.

BETTER CUSTOMER SERVICE

Still another sweet advantage of SyncSort DOS: help is always there when you need it. 85% of all requests for service are resolved within 24 hours. We always rise to the occasion.

The moral to this story: smart cookies are quick to reject half-baked solutions in favor of SyncSort DOS. Call us for a demonstration. Once you get a taste you will be hungry for more.

SyncSort DOS
One smart cookie deserves another.

syncsort
INC.

Syncsort Incorporated 50 Tice Boulevard, CN18, Woodcliff Lake, N.J. 07675

Apollo, DEC bolster lines in hot engineering terminal mart

DG joins fray with software packages

By Rosemary Hamilton

CHELMSFORD, Mass. — Apollo Computer, Inc. last week rolled out two workstations that are based on and slated to replace the mid-range and high-end models the company introduced earlier this year.

Also last week, Digital Equipment Corp. cut prices and added enhancements to its workstation line.

In a further development last week in the hotly competitive engineering workstation market, Data General Corp., which has not been a significant factor in the engineering workstation market, jumped further into the fray by announcing two engineering software packages.

The Apollo DN570 Turbo and DN580 Turbo use a redesigned CPU and include expanded main memory and disk storage. Apollo will likely discontinue the current DN570 and DN580 models next year, according

to Edward Zander, vice-president of marketing, although a final decision has not been made.

The DN570, designed for two-dimensional applications, and the DN580, designed for three-dimensional, graphics-intensive applications, were replacements themselves for earlier Apollo models.

For current DN570 and DN580 customers, a Turbo Performance Package is available to upgrade to either Turbo model.

The DN570 Turbo has a base price of \$43,900, and the DN580 Turbo's price starts at \$57,900. Pricing for the upgrade package starts at \$12,500. Both Turbo models will be shipping in November.

Apollo said the new CPU, based on a Motorola, Inc. 68020 microprocessor, and other system enhancements have boosted the Turbo models' graphics performance by 30% to 50% over the current performance of the DN570 and DN580 models.

The Turbos feature a new, no-wait-state CPU with a 16K-byte physical cache memory and a 32-bit

system bus, instead of the 16-bit bus used with the current models.

Integrating the CPU with the cache memory allows programs to access instructions in a no-wait state, while the new bus provides for faster communications between the CPU and other system devices, according to Helen Fuller, high-end workstations product marketing manager at Apollo.

Memory capacity

The new systems will be offered with a minimum of 8M bytes of main memory, expandable to 16M bytes, while the DN570 and DN580 systems have a minimum configuration of 2M bytes. Disk capacity has been expanded to 2G bytes from 308M bytes.

Last week, DEC revamped three workstation models by boosting their minimum memory configurations from 3M bytes to 5M bytes and cutting prices on two of the models.

The company also added a \$995 graphics tablet for the GPX series that allows users to input freehand sketches. The new GPX systems and

tablet are currently available, the vendor said.

Both color and gray-scale versions of the four-plane models were also reduced in price by nearly \$10,000. The color eight-plane model will continue to sell for \$39,950.

Data General's two packages, TEO/Electronics and TEO/3D, were designed for DG's DS7500 engineering workstations, although they can also run on the vendor's full line of superminicomputers. The packages are part of the vendor's Technical Electronic Office (TEO) product line, which is modeled after its Comprehensive Electronic Office (CEO) software.

TEO/Electronics was designed for computer-aided engineering (CAE) applications and is made up of four separate components that will be sold separately and will range in price from \$1,500 to \$15,000. TEO/3D, which ranges in price from \$25,000 to \$170,000, depending on the number of users, was designed for three-dimensional modeling applications.

Gates talks: 386 machines

From page 1

order to meet their schedule and get it done, to use an 8-bit micro. So starting in early 1982, people were moving up to 16-bit, and for a couple of years people were learning how to take advantage of that machine.

Then a year ago, people started to hit the memory barrier. There are things the memory barrier is preventing people from doing. There is this bank switching stuff, the so-called expanded memory specifications that lets them get beyond that a little bit, but it is not as nice as having a large address space.

There will be advances in the operating system to support those new modes in DOS specifically. In the near future, you will see 386 machines, and those support address space of 4G bytes, which is larger than the largest IBM mainframe address space.

In order for applications to do major things, you have to have improvements first at the hardware level and then at the systems software level. Because of the nature of the 286, that was very difficult to do. There won't be the same kind of lag time for the 80386. Applications will be able to get at an incredible amount of power and performance. The 80386 is more powerful than most of the minicomputers out there today.

CW: What can you tell us about your work with Intel Corp. on the 80486?

GATES: It is so far off that there is nothing concrete at this stage. We have some ideas about how to advance the state of the art in microprocessors based on using some of our compiler technology.

CW: Do the other large micro software companies have an advantage because Microsoft is more willing to share development information with them?

GATES: When we do a new product development, we have to protect ourselves; we just can't go out and publicly talk about the specs and things like that.

A lot of the people you want to

work with early on are the ones whose feedback will help you to make the product better. Some of these large companies do have good R&D people. Lotus has [Ed] Below, a very smart guy; Ashton-Tate has [Robert] Carr, who is also a very smart guy. It is true that we sometimes show things early to those guys to get their feedback. There is an economic benefit to us there.

CW: Some software developers have charged that when Microsoft says that writing for Windows is much like writing for DOS, and that's a way of coercing developers into writing for Windows.

GATES: The memory management and multitasking approach used inside Windows is the same as is used in future versions of DOS. Working with Windows memory management prepares you for working with the new version of DOS.

It is not to say that the new version of DOS has all of Windows in it. It doesn't have an embedded graphical user interface.

Should we have made them different? It is the same code. There is no pressure on anyone to develop for either Windows or the new version of DOS. I hope people decide to do it.

CW: Do you expect any problems in running the next version of DOS on IBM Personal Computer AT compatibles?

GATES: If something is truly, truly compatible, put the disk in and you're going. Every new piece of software has the potential to reveal areas where compatibles aren't compatible, and DOS 286 is no different. It actually has high potential to reveal incompatibilities.

CW: Is there any way for a corporation with compatibles to know which ones will be compatible?

GATES: Not today. Does it make sense to have a 286 DOS that doesn't run on popular machines? To the degree that those machines are out there, and can be tested — hey, let's be compatible.

CW: What should IBM do to prevent losing more market share to the clones?

GATES: IBM's best bet is to advance the state of the art aggressively. Some of the elements with which they advance the state of the art, whether it be custom chips or special communications software, should be things that can't be easily duplicated.

CW: What challenges does Apple face over the next year in establishing the Macintosh as a "second standard"?

GATES: They have to deliver on connectivity. It is technically possible to connect these wires together, but there are some software pieces that are missing. They have got to evolve the product line.

If a company wants to run some application that only exists on DOS, you have to make it possible for those five people to run their application. I think Apple can solve that. But if you have a hundred people who want DOS machines, there will never be a reason to call Apple.

CW: Will MS-DOS ever become multiuser?

GATES: We think DOS is much better for doing networking and multitasking, particularly when you look at things like graphics user interface. Having everybody on a shared processor can lead to unpredictable performance; that also doesn't lead to good expandability, and it is not going to save you that much.

CW: What do you have to do to keep maintain the dominance of DOS?

GATES: We have to be as good as minicomputer operating systems have been, and we have to be upwardly compatible.

CW: Do you see any competition coming in that area?

GATES: How could you get developers interested in doing software for something that wasn't compatible with DOS?

CW: Yet, it still seems that software development is lagging behind the development of hardware.

GATES: In 1981, we convinced IBM that they should use a 16-bit micro even though they were tempted, in

Users say workstation war small factor in purchase decisions

Budget cycles overrule vendors' repositioning

By Rosemary Hamilton

Engineering workstation vendors last week were embroiled in the second round of product repositioning of the year, but the frenzy appeared not to make the intended impact on the market. Users contacted by *Computerworld* claimed they have adjusted to the competitive atmosphere and will make purchase decisions based not on vendor claims, but on internal business concerns.

In a 24-hour span last week, Apollo Computer, Inc. introduced enhanced mid-range and high-end systems, Digital Equipment Corp. cut prices by nearly \$10,000 on two Vaxstation II/GPXs and added enhancements to its workstation line and Data General Corp. rolled out engineering software for its workstation offerings (see story page 6). The announcements came one week after a major product debut from Sun Microsystems, Inc.

"We're getting used to this activity," said Thomas Heim, manager of

the engineering computation center at the Space and Technology Group of TRW, Inc. "Our purchasing goes according to the corporate capital cycle more than anything else. We get the best bang for the buck at the time the money is allocated."

Like Heim, other users interviewed said the leapfrogging in workstation price and performance is not a major concern in purchasing decisions. Instead, users cited corporate budgets, vendor loyalties and the ability to match available systems to particular needs as the major factors in making purchases.

"Up front, I'll tell you I'm a big fan of Sun Microsystems," said Robert Judd, group leader of the computer

graphics group at the Los Alamos National Laboratories, a research center in Los Alamos, N.M. "I think it's more important to buy into a vendor's philosophy rather than a particular item that's the rage this week."

Standard to put in a change order

TRW's Heim said it has become standard procedure at his firm to "put in a purchase order and then expect to put in a change notice." That way, he said, "we end up taking delivery of the latest product."

At AT&T's Bell Laboratories' facility in Murray Hill, N.J., Mark Plotnick, a member of the technical support staff, said the vendor activity makes it "kind of challenging to or-

der something.

"We get a workstation at the exact time when somebody needs it," Plotnick said. "We can't delay these decisions arbitrarily. Sure, almost by the time it's arrived there will be something that's a better value. But that's the nature of this market right now," he said.

"It's the same old story in the workstation market as in any other industry," summed up Richard Shaffer, editor and publisher of "The Computer Letter." "If you can cost-justify a machine now, you go ahead and purchase it. Actually, I think the users are getting a hell of a deal because the prices on the hardware keep coming down."

TOP OF THE NEWS

NEWS from page 1

IBM's DP market strategy since 1979 — soon may be targeted strictly at the scientific and engineering markets and restricted from the commercial data processing market.

The source reported that customers of the 4300 will be steered toward the IBM System/38 product line. But other industry analysts said they had not heard the reports and doubted that IBM would take an affirmative action to pull the 4300s out of a specific market.

However, those same analysts conceded that concentrating 4361 and 4381 sales efforts in the scientific and engineering markets is part of IBM's current strategy.

Troubled Daisy Systems Corp. reported a major management shake-up late last week. Daisy's cofounder, President and CEO Aryeh Finegold and Chairman Frederick Adler resigned from the slumping Mountain View, Calif., engineering workstation firm.

Board member Max Palevsky took over the positions of chairman and CEO, and Executive Vice-President Harvey Jones was named president and chief operating officer.

Jones, 33, cofounded Daisy with Finegold and David Stamm, who rejoined the company as executive vice-president after recently resigning from that post.

AT&T Information Systems will market Oracle Corp.'s IBM SQL-based relational data base management system on its personal computer line in the last quarter of the year.

The DBMS will run on the AT&T 6300, 6300 Plus and Unix PC. No pricing has been set yet, AT&T spokesmen said.

Try the Most Productive DASD Management System

Free for 90 Days

...and you will see why thousands of MVS and MVS/XA sites use FDR, COMPAKTOR and ABR for storage management.

As the number of 3380's increases, old methods of managing disk space no longer work. The need for a more automated system is obvious.

INNOVATION, the leader in DASD management systems with FDR, COMPAKTOR and ABR Version 5.0, has the "STRATEGIC" products to meet your DASD management needs whether you have 16 or 1600 disks.

Fill in the coupon below or call INNOVATION at (201) 777-1940 for further information or a 90-day trial and see your backup problems disappear.

Available for IBM VS1, MVS and MVS/XA systems.

I am interested in DASD Management. Send me:

- Free 90-day Trial
- FDR V5.0 User Manual

Name _____ Title _____

Company _____

Address _____

City _____ State _____ Zip _____

Telephone () _____ Ext. _____

Mail coupon to: Innovation, 970 Clifton Ave., Clifton, NJ 07013-2793

Call Innovation today at (201) 777-1940 for
The Fastest DASD Management System



INNOVATION
DATA PROCESSING
970 Clifton Ave., Clifton, NJ 07013-2793

NEWS

Largest users win Lotus concessions

From page 1

iting software piracy and that the prohibition is enforced. In addition, the firm must have the latest releases, Lotus 1-2-3 Release 2 or Symphony 1.1. If these conditions are met, Lotus will send the firm a utility that will remove software protection from existing disks. The utility will not be available for Lotus 1-2-3 Release 1A.

Smaller firms can have copy protection removed through the Extended Value Program. Those firms must have at least 100 users upgraded to the latest versions of Lotus software, and company officials must sign anti-piracy contracts similar to those of Corporate Access customers.

Larger customers tended to applaud Lotus's efforts to remove copy protection and sell direct. Others complained about the large volumes required to get direct sales, the high cost of support for smaller firms and the remaining limitations on the removal of copy protection.

User reaction

Despite the stringent requirements, some users were pleased with the removal of copy protection. "I am very much in favor of Lotus's approach to copy protection. If a company is not committed to not pirating, they shouldn't get unprotected software," said Alan Gross, chairman of the Microcomputer Managers Association in New York.

Many, however, were displeased by requirements of the antipiracy program. "It is extreme. The requirement of having the latest version is a financial burden. They are locking people into upgrades," said Steve Roth, manager of decision support systems for Manufacturers Hanover Leasing Corp. in New York.

The plans for the removal of copy protection are aimed at getting more corporations to upgrade to the latest version of Lotus products, Crummey admitted.

Like Special Bids, electronic distribution of 1-2-3 from a mainframe is available only to large Lotus customers.

"Today electronic distribution is for 1-2-3, but the intention is to have all Lotus products available on the mainframe," Crummey said. Electronic distribution is available for systems running IBM's VM. Distribution on an IBM MVS-based system is currently in development. Lotus will deliver a tape with the software to be

loaded onto the mainframe and will use a similar approach for product upgrades and maintenance releases.

Up to 50 firms interested

"Ten to 15, to 20, growing to 50 firms have expressed interest in it. Those are the ones that are wired and connected," Manzi said.

Some users were concerned with the large purchases required to qualify for Special Bids and electronic distribution.

"My objections to the way they handle these situations is that they

tend to eliminate whole areas of their user base when they make these kinds of announcements," said a micro manager who asked not to be identified.

Others were less critical. "It may be too high, but keep in mind that this is a beginning, an initial stab. There is nothing restricting them from lowering that level," said Ted Klein, president of the Boston Systems Group, Inc., a management consulting firm familiar with the program. Other sources indicated that Lotus will lower the 500-unit require-

ment for direct sales and free support.

Small firms pay for support

Debate also centered around Lotus's charging smaller firms for support. Under the Lotus Prompt program, smaller customers pay \$150 per year per user for the same level of support that Corporate Access customers receive free.

"I don't like that at all. We have a staff here that is already familiar with Lotus, and we already provide the support," said Bob Dusse, information center section manager at Charles Schwab & Co.

"It is more than a little bit steep. You have got vendors out there like Corporate Software, Inc. that give you support free. We have a corporate expert who knows Lotus products intimately. He is available at a much lower cost to our users," Manufacturers Hanover's Roth said.

Quantity buyers get perks

Summary of Multi-Value Plan components and Lotus Development Corp. announcements:

- Corporate Access involves firms eligible for direct sales through special bids or electronic distribution.

These customers order 500 or more Lotus packages per year and are assigned a dedicated account team, sales representative, systems engineer, training contact and product specialist. Support, provided for free, includes a toll-free telephone hot line (in which the number of contacts is based upon the size of the organization and the account), free invitations to Lotus-sponsored seminars and conferences, executive briefings, product prerelease programs, "Update" (a quarterly newsletter) and a technical handbook updated semiannually. The corporations themselves are also eligible for limited liability contracts. Updates are sold direct.

• Special Bids involves the placing of volume orders direct to Lotus, and it requires a minimum of 500 units to be shipped to a single location. The corporation is responsible for distributing the packages to users.

• Electronic Distribution requires an IBM 370 mainframe or compatible and personal computers with IBM 3270 emulation. It is available for firms purchasing 500 or more units, and the corporation is responsible for downloading and distributing documentation.

• Lotus Prompt, a \$150 support program that provides special toll-free phone support (eight calls per contract to senior technical staff, quicker response), a quarterly newsletter, 50% discount on any two different Lotus companion products and maintenance and up-

grade packages.

Smaller firms essentially pay for the same level of support that larger customers receive free.

• Extended Value Program is available to approximately 400 firms that have upgraded at least 100 users to the latest version of 1-2-3 or Symphony. It provides discounts on Lotus companion products and the ability to remove copy protection from those upgraded units. Lotus declined to disclose the program's price.

• Lotus Direct is a business unit that provides direct sales to any size corporation of Lotus companion products. All sales are at full retail price.

• Lotus will form a Lotus Corporate Council based upon 12 major customers to meet twice annually to discuss "business issues."

• Unprotected versions of 1-2-3 will be made available to U.S. government agencies. Lotus has been locked out of many government bids based on the copy protection. Availability is scheduled for Nov. 15, the company said.

• Lotus announced five authorized training centers to provide "high-quality training."

• Lotus created the Application Services group to assist corporate customers in developing specialized applications.

Initially available in New York and Boston, the service will spread to most other major cities by mid-1987.

• Later this year, Lotus will announce another companion product designed to speed the use of its spreadsheet software, according to Michael E. Kolowich, corporate vice-president of marketing and business development for Lotus. "A true networking product will have to wait for the maturation of the networking operating systems and other operating systems in order to truly provide a good group productivity solution in the spreadsheet world."

Networker puts 1-2-3, Symphony on file server

Lotus Development Corp. last week also announced the Networker, a package that will allow 1-2-3 and Symphony to be installed on a file server and accessed by users on personal computers tied in via a local-area network.

The software can then be loaded onto PCs without a key disk. Via the Networker's Network File Access Program, networked users can retrieve shared work sheet files and lock other users out from the file while it is in use.

The product works only with the most current versions of 1-2-3 and Symphony but will not be available until the first quarter of next year. Customers will be billed on the number of packages used.

"We are talking about server-based management of the software. The idea is to have a network authorization package sitting on the server, which has a counter which counts the number of software packages installed on the server and counts against that the number of simultaneous users who are using the software at any given time," said Michael E. Kolowich, corporate vice-president of marketing and business development for Lotus. "A true networking product will have to wait for the maturation of the networking operating systems and other operating systems in order to truly provide a good group productivity solution in the spreadsheet world."

HP software uses idle MIPS, pushes OA functions to micros

By Charles Babcock

PALO ALTO, Calif. — Hewlett-Packard Co. last week said it is offering added functionality on its Personal Productivity Center minicomputer package and pushing function down to the level of personal computers.

As one of the top three office automation companies in the U.S., according to Framingham, Mass.-based International Data Corp., HP is directing its strategy toward making use of the idle million instructions per second on micros, according to

Pete Shepherd, product manager of HP's Office Productivity Division in Wokingham, England.

HP is introducing Advancemail, a \$395 electronic mail service that resides on an IBM Personal Computer or HP compatible and connects to the HP Deskmanager, an existing application manager resident on the HP 3000 minicomputer.

In addition, HP announced Version B of Deskmanager for \$4,800 to \$12,000; HP File/Library, an optional package for community filing and ar-

chiving for \$2,800 to \$7,000; and HP Schedule, an option for scheduling meetings and use of resources for \$1,200 to \$3,000, the company said.

With Advancemail, users can compose messages, including files, on personal computers and transfer them to the Deskmanager for distribution. Advancemail can direct messages to be stored on the HP 3000 until called for.

Because the micro, rather than the minicomputer, processes these functions, the number of users who can be

supported by one HP Personal Productivity Center is doubled, Shepherd said.

Once messages are sent to the Deskmanager, the mini-based software can forward them to other Deskmanager units or IBM's Professional Office System and Distributed Office Support System office automation systems, he said.

Version B of the Deskmanager includes enhancements to electronic mail, word processing, electronic filing and time management functions.

6 REASONS WHY

PDSFAST IS THE CORPORATE STANDARD AT OVER 1,000 MVS INSTALLATIONS WORLDWIDE

- 1 DASD Space Reclamation** PDSFAST can increase DASD space reclamation by 40 to 60 percent.
- 2 DASD Management** PDSFAST interfaces with ALL EXISTING DASD MANAGEMENT PACKAGES reducing elapsed times by 75 to 90 percent.
- 3 IEBCOPY Usage** PDSFAST is a JCL-transparent replacement for lebcopy. It will compress, copy and unload PDS datasets to tape or disk at 5 to 80 times the speed of lebcopy.
- 4 SPFCOPY** Provides ultra high speed compression under SPF 3.1 WITHOUT REQUIRING AUTHORIZATION.
- 5 SMP Processing** Speeds up ALL LEVELS of SMP processing by 25 to 90 percent.
- 6 CICS/IMS** Greatly reduces system downtime by compressing and copying CICS/IMS datasets in less than 1/20th the time presently used.

PDSFAST benchmarks taken from user evaluations:

	Elapsed Time	CPU Time	EXCP's	Job Cost
52 cyl. PDS Compress				
lebcopy	67 min. 18 sec.	12 min. 27 sec.	103,486	\$131.05
PDSFAST	3 min. 23 sec.	8 sec.	712	\$4.22
12 cyl. PDS Copy				
lebcopy	9 min. 14 sec.	1 min. 20 sec.	10,792	\$18.47
PDSFAST	48 sec.	.7 sec.	122	\$1.75
47 cyl. PDS Unload to Tape				
lebcopy	58 min.	14 min. 52 sec.	97,253	\$92.05
PDSFAST	4 min. 3 sec.	37 sec.	911	\$5.74
3380 TSO Volume Compress 2,679 Individual PDS's				
PDSFAST Driver	11 min. 7 sec.	31 sec.	8,299	\$29.87

The PDSFAST driver interfaces with all DASD management and DEFrag packages.

As you can see, PDSFAST is *ultrafast* and *cost effective*, combining wide ranging performance benefits with transparent operation. Our users tell us PDSFAST is the most impressive performance product they have seen in years.

PDSFAST is saving thousands of dollars daily in human and machine resources at over 1,000 sites worldwide. We are sure PDSFAST will benefit your installation.

For further information about PDSFAST call SEA at (516) 328-7000, located at 2001 Marcus Avenue, Lake Success, N.Y. 11042.

SOFTWARE ENGINEERING OF AMERICA

SEA

NEWS

Dbase Mac aids Apple attempt to create alternate standard

Marketing drive may desert other vendors

By Maura McEnaney

PALO ALTO, Calif. — Ashton-Tate last week announced its expected data base management package for the Apple Computer, Inc. Macintosh, adding its endorsement to Apple's plans to create an alternate standard to IBM.

The package, Dbase Mac, is a relational data base management system that uses the Macintosh interface to allow users to set up their own data relationships without programming. The product is priced at \$495 and is scheduled for release in the fourth quarter. The initial release is a single-user product, but Ashton-Tate said a multiuser version for network use will follow.

Apple Chief Executive Officer John Sculley joined Ashton-Tate CEO Ed Esber in announcing the product, which was exhibited last week at the Macworld Expo in Boston.

"We made sure you could do on the Macintosh version anything you could do on the IBM versions," said Michael Stone, director of new product marketing. Stone stressed that Dbase Mac is not a part of the Microsoft Corp. MS-DOS Dbase III package. The Macintosh product "significantly reduces the amount of programming" required by users, he said.

"In Dbase for the Mac, you can see a lot of features that will be in future generations of our IBM products," particularly through the more advanced user interfaces and use of graphics, Stone said.

Sculley's presence at the introduction raised some questions as to whether Apple will throw its marketing weight behind Ashton-Tate and abandon support for early Macintosh DBMS products such as Blythe Software, Inc.'s Omnis III Plus and Double Helix from Odesta Corp.

At last Monday's announcement in Apple's backyard of Palo Alto, Calif., Sculley said Apple will put major marketing resources into marketing Dbase Mac, although he would not elaborate on the agreement.

Ashton-Tate's entry into the Apple DBMS market may be too late to woo customers who already use other Macintosh DBMS products. For the past six months, Macintosh users at Seafirst Corp. in Seattle have been working with Blythe's Omnis III. Seafirst has not looked at the Dbase Mac product because of its success with Omnis, according to Assistant Vice-President Jim Kuhn.

Omnis, he said, "is a pretty easy-to-use product. It's fully relational and fully programmable in terms of the way you can set up relations between different files in a data set."

Although Seafirst uses some of Ashton-Tate's Dbase products, he added, "I don't feel there is a compelling reason to drive us into the Dbase environment."

While several Macintosh users contacted before the product announcement were not sold on the idea of Dbase for the Macintosh [CW, Aug. 11], analysts present at the product announcement handed in positive reviews.

Infocorp's Bob Lefkowitz said he was impressed with the product because of the way users can actually see the relationships they are setting up between data structures. "You can't visualize it as easily in other products," he said. "I think this product will do all right."

Dbase Mac allows users to link up to 36 data files through common fields. The relationships are established by using the mouse to carry a key field from one file to another. An arrow appears on the screen to illustrate the data relationship.

The product also lets users customize reports by selecting type styles and fonts. The product supports Apple's ImageWriter printer, LaserWriter and LaserWriter Plus.

Dbase Mac has the capability to let users access IBM-compatible Dbase data files and can transfer files via the standard ASCII test. The product will run on a Macintosh with 512K

bytes of random-access memory or on a Macintosh Plus with a System 3.1 operating system and a minimum of two disk drives, one of which must be the recent 800K-byte capacity drive. It can also be installed on hard disks.

Ashton-Tate's introduction has refocused the discussion as to whether the Macintosh can be a viable product in the business market. "We saw the Macintosh becoming a standard for its user interface," Esber said. "The fact is the Macintosh is a success as a business tool." Esber said he expects the product's procedural language to encourage new applications from third-party developers.

Stone conceded that few corporations have standardized on the Macintosh, but he noted the machines are increasingly penetrating that market. "The Macintosh is legitimizing the side door," Stone said. Consequently, more Macintosh products are to follow, and he added, "We're definitely up to our eyes in Mac development."

But according to Infocorp's Lefkowitz, the real success of Ashton-Tate's product will depend on the future plans for the Macintosh. "The key is what the announcements for the Mac will be over the next six months. If the Mac were going to stay where it is now for the next six months, I don't think Ashton-Tate would have announced anything," Lefkowitz said.

**Macworld Expo
coverage on page 12**

*There are
more than
5,000
installations
of the
PowerHouse®
development
language
around
the world*

**is for
all around
you**

COGNOS

In the U.S. call 1-800-4-COGNOS
In Canada call 1-613-738-1440
In the U.K. call +44 344 486668

PowerHouse is a registered trademark of Cognos

B

**is for
bridging
databases**

COGNOS

In the U.S. call 1-800-4-COGNOS
In Canada call 1-613-738-1440
In the U.K. call +44 344 486668

GET HALF-A-COMPUTER FREE WITH ORACLE VERSION 5



With ORACLE version 5, you save half the computer you thought you needed in order to "go relational"... some benchmarks indicate you save even more.

WHY IS VERSION 5 OF ORACLE SO FAST ON MAINFRAMES, ON MINIS AND ON MICROS?

REASON #1: AI OPTIMIZES QUERY PROCESSING.

V5 applies artificial intelligence to SQL query optimization. For example, few DBMSs can optimize the query "Select accounts 90-days overdue **and** accounts over \$10,000." But only ORACLE can optimize "Select accounts 90-days overdue **or** accounts over \$10,000."

REASON #2: ARRAY PROCESSING OPTIMIZES ACCESS TO LARGE SETS OF DATA.

Relational DBMSs have always dealt with **logical** sets of data. But they manipulated only one **physical** record at a time. V5 eliminates overhead by physically delivering arrays of hundreds, even thousands, of records at a time.

REASON #3: PARALLEL-PROCESSING OPTIMIZES COMPUTER RESOURCE USAGE.

V5 is 100% re-entrant shared code, and ORACLE's parallel-processing architecture fully exploits modern dyadic and quadratic processors from IBM, and other multi-processing computers such as those from DEC and Stratus. So ORACLE uses all the MIPS in parallel-processor configurations.

REASON #4: MULTI-TABLE CLUSTERING OPTIMIZES JOINS.

ORACLE stores data from different tables on the same physical disk page. This technique—called *multi-table clustering*—permits you to access data from multiple tables in one disk read operation. Clustering improves ORACLE performance on all multi-table operations, such as join queries, update transactions, etc.

REASON #5: HIGH-SPEED RELATIONAL SORT FACILITY OPTIMIZES DATA AGGREGATION

Ad hoc relational queries frequently request that data be grouped, ordered or otherwise sorted. V5's internal sort facility performs aggregation and elimination early, faster than previously thought possible.

REASON #6: EFFICIENT ROW-LEVEL LOCKING OPTIMIZES TRANSACTION THRUPUT.

Row-level locking and a read-consistency model optimizes ORACLE V5 transaction concurrency. For the first time, high transaction thruput is achieved by a fully relational DBMS.

THE ULTIMATE REASON

Oracle introduced the first relational DBMS and the first implementation of SQL back in 1979. Today ORACLE is installed on thousands of minis and mainframes, and over ten-thousand PCs. ORACLE is the only SQL-compatible relational DBMS that's portable across IBM mainframes, DEC, DG, HP and most other vendors' minis and micros, including the IBM PC. And ORACLE applications and databases are *connectable* across different hardware and operating system, providing you with a true distributed solution to your information needs.

Spend half a day at an Oracle seminar in your city, and find out how you can have the benefits of a portable, DB2-compatible relational DBMS...and save half a computer. Call our national seminar coordinator at 1-800-345-DBMS. Or write Oracle Corporation, Dept. V5, 20 Davis Drive, Belmont, CA 94002.

U.S. SEMINARS

AK Anchorage	Sep 9
AL Huntsville	Dec 9
Mobile	Sep 10
AR Little Rock	Sep 30
AZ Phoenix .. Aug 5, Oct 16, Dec 2	
CA Los Angeles .. Aug 6, Sep 11, Oct 14, Nov 13, Dec 16	
Newport Beach . Sep 25, Nov 11	
Sacramento	Jul 22, Sep 18, Oct 30
San Diego	Aug 7, Oct 7, Nov 6
San Francisco .. Aug 5, Sep 9, Oct 14, Nov 6, Dec 9	
San Jose	Aug 7, Sep 23, Oct 21, Nov 13
CO Denver .. Sep 18, Oct 21, Dec 10	
CT Hartford	Sep 10, Oct 22, Nov 13
New Haven	Aug 20, Oct 8, Dec 4
FL Ft. Lauderdale	Nov 19

Jacksonville	Aug 5	Grand Rapids	Oct 16	Cincinnati	Aug 5, Oct 21	Houston	Aug 19, Sep 11, Oct 16, Nov 20, Dec 4
Orlando	Sep 17, Nov 18	MN Minneapolis	Jul 22, Sep 9, Nov 4, Dec 18	Cleveland	Jul 22,	Lubbock	Oct 2
Tampa	Aug 6	MO Kansas City	Nov 12	St. Louis .. Jul 30, Sep 25, Nov 19	Sep 23, Oct 28, Nov 13	San Antonio ..	Aug 27, Nov 5
GA Atlanta	Sep 23, Nov 6	Columbus	Oct 8	Dayton	Sep 9, Nov 5	UT Salt Lake City ..	Aug 6, Sep 16, Oct 7, Dec 4
IA Des Moines	Aug 27, Oct 29, Nov 11	MS Jackson	Sep 11	OK Oklahoma City ..	Sep 3, Dec 3	VT Burlington	Aug 6
ID Boise	Jul 31, Sep 11	NC Charlotte	Sep 6	Tulsa	Aug 26, Nov 19	VA Richmond	Sep 10
IL Chicago	Aug 14, Sep 18, Oct 9, Nov 5, Dec 18	Raleigh	Oct 8	NE Omaha	Sep 24	WA Seattle	Oct 23, Dec 11
IN Indianapolis	Aug 19, Oct 15, Dec 9	NE Cherry Hill	Sep 20	NJ Convent Station ..	Aug 7, Aug 28	WI Milwaukee	Sep 9, Nov 13
KS Wichita	Sep 4	Iselin	Jul 22, Sep 16, Oct 9, Oct 30, Nov 13, Nov 20	Princeton	Sep 25	Calgary	Sep 25
KY Louisville	Aug 7	NM Albuquerque ..	Sep 16, Dec 10	NY Albany .. Jul 23, Sep 11, Nov 20	New York City .. Jul 24, Aug 12, Aug 26, Sep 3, Sep 17, Oct 2, Oct 22, Nov 6, Nov 25, Dec 9	Halifax	Oct 15
LA New Orleans	Sep 25, Dec 9	MA Boston	Sep 16, Oct 15, Nov 12, Dec 10	Scanton	Sep 18	Montreal	Aug 20, Sep 17, Oct 15, Nov 24, Dec 17
MD Bethesda	Jul 23, Aug 7, Sep 4, Oct 1, Oct 16, Oct 29, Nov 13, Dec 10	MD Springfield	Sep 18	SC Charleston	Sep 18	Ottawa ..	Aug 7, Sep 11, Oct 9, Nov 13
MI Detroit	Aug 19, Sep 16, Oct 14, Nov 18	OH Akron	Sep 18, Oct 15, Nov 18, Dec 10	TN Memphis	Sep 18	Quebec City ..	Sep 10, Nov 12
FL Ft. Lauderdale	Nov 19	OH Syracuse	Sep 18, Oct 21, Dec 16	TX Amarillo	Sep 19	Toronto	Aug 12, Sep 9, Oct 7, Nov 4, Dec 2
		OH Akron	Sep 18, Oct 21, Dec 16	Austin	Sep 18, Nov 6	El Paso	Dec 18
			Sep 18, Oct 21, Dec 16	Dallas	Sep 19, Oct 14, Nov 18, Dec 11	Ft. Worth	Sep 23, Nov 13
			Sep 18, Oct 21, Dec 16			Vancouver	Oct 2
			Sep 18, Oct 21, Dec 16			Winnipeg	Aug 5, Oct 16, Dec 4

CANADIAN SEMINARS

Calgary	Sep 25
Halifax	Oct 15
Montreal	Aug 20, Sep 17, Oct 15, Nov 24, Dec 17
Ottawa ..	Aug 7, Sep 11, Oct 9, Nov 13
Quebec City ..	Sep 10, Nov 12
Toronto	Aug 12, Sep 9, Oct 7, Nov 4, Dec 2
El Paso	Dec 18
Ft. Worth	Sep 23, Nov 13
Vancouver	Oct 2
Winnipeg	Aug 5, Oct 16, Dec 4

ORACLE®

COMPATIBILITY • PORTABILITY • CONNECTABILITY

Ottawa (613) 238-2381 □ Quebec (514) 337-0755 □ Toronto (416) 362-3275
ORACLE-U.K. (SURREY) 44-1-948-6976 □ ORACLE-EUROPE (NAARDEN, THE NETHERLANDS) 31-2159-49344

Call (800) 345-DBMS today.

©1986 by Oracle Corporation. ORACLE® is a registered trademark of Oracle Corporation. SQL/DS, DB2 and IBM are registered trademarks of IBM. DEC, AT&T, Stratus, HP and Bell Laboratories own numerous registered trademarks. TRBA.

NEWS

IBM recovery system delayed

From page 1

systems. Observers predicted it may be as much as a year before the package becomes generally available.

In the announcement, IBM stated that it has been forced to stretch its "early support program," an IBM euphemism for beta-site testing, of Extended Recovery Facility. Originally announced in February 1985 in conjunction with the Sierra 3090 mainframe, XRF was due for release to IMS users by the third quarter of 1986.

IBM is now saying "the high availability provided by XRF requires extraordinary levels of quality, thereby necessitating continued refinement of the product." The Aug. 5 announcement was a terse, four-paragraph statement that supplied no estimate of when XRF will be available, saying only that more information will be released in the first quarter of 1987.

'A tough bite to chew'

Developing XRF "is a tough bite to chew," conceded Paul Neuman, IBM spokesman in Rye Brook. "We are still getting the product to the point where we think the quality is what it should be," he said.

XRF was to be the product that would allow users of the IMS data base management systems to keep a mirror image of IMS transactions on a

second processor, offering instantaneous backup if the main system were to go down. It was primarily sought by IBM's largest IMS users with extensive data bases involved in financial transactions, such as banks, brokerage houses and insurance companies.

"Some of these companies have hundreds of thousands of dollars moving through the IMS pipeline at any one time. If all of a sudden the pipeline breaks, they're losing money," said Francis Gens, an analyst with International Data Corp., a market research firm in Framingham, Mass.

XRF is actually not one product but a series of enhancements to five other IBM products: IMS/VS Version 2; MVXSP Version 2, Release 1.3; ACF/VTAM; ACF/NCP Version 4; and MVS/XA DFP Version 2.

The number of customers taking part in the early support program is believed to be small, no more than five, and they have been asked by IBM to remain silent on the product's problems, according to Thomas Henkel, senior analyst at the Yankee Group.

"It's the kind of product that you are better off delaying rather than delivering a bad product," he noted. Bugs were found in IBM's own XRF installation in Poughkeepsie, N.Y., and differences between that site and customer sites produced additional installation problems, he claimed.

Henkel estimated XRF may become available during the first half of 1987, but Gens predicted it will be another year before it is out.

Apple encourages third-party vendors at Macworld Expo

By Peggy Watt

BOSTON — Software products led the parade at the second Macworld Expo last week, which drew a liberal mixture of corporate, small-business and hobbyist fans.

Microsoft Corp. reaffirmed its interest in the Apple Computer, Inc. Macintosh with release of Macworks, an integrated package not unlike Apple's own popular Appleworks for the Apple II family.

Ashton-Tate also showed its Dbase for the Mac (see related story, page 10).

Among the handful of other products and upgrades announced were utilities, fonts and peripherals from both large and small vendors.

Technical support organization

Apple itself encouraged more of the same from third parties by announcing its Apple Programmers and Developers Association, a technical support organization for third-party and in-house corporate developers of Macintosh products.

The association is to be run by the Apple co-op in Renton, Wash.

For a \$20 annual fee, an individual receives a quarterly catalog of development tools, technical notes and manuals and a newsletter to encourage communication among developers of all Apple products, according

to Dan Cochran, manager of languages and tools, who is Apple's liaison to the new group.

"We're trying to serve not just the Lotuses and Microsofts but the hackers and the educators and the DP/MIS managers," Cochran said.

Microsoft's Macworks was enthusiastically endorsed by Apple Chairman John Sculley, who said he finds the package easier to use for most basic tasks than Jazz, a much-touted integrated applications package released last year by Lotus Development Corp.

'Important strategic product'

"I consider this an important strategic product in the continuing development of the Macintosh," Sculley said.

The \$295 program, which is due out in September, includes word processing, data base management and spreadsheet with charting functions as well as communications. All of these functions are integrated for data exchange.

It runs on either a Macintosh Plus or a Macintosh with 512K bytes of memory and is available on 400K-byte disks on request.

Microsoft Chairman Bill Gates said Macworks is intended for the general business user, particularly first-time users.

The PowerHouse® language is used by 115 Fortune '500' companies and is taught in more than 100 colleges and universities

**is for
companies
and
colleges**

COGNOS

In the U.S. call 1-800-4-COGNOS
In Canada call 1-613-738-1440
In the U.K. call +44 344 486668

PowerHouse is a registered trademark of Cognos

You can call on any of our 36 offices in eight countries for PowerHouse® software, service, and support

is for office doors

COGNOS

In the U.S. call 1-800-4-COGNOS
In Canada call 1-613-738-1440
In the U.K. call +44 344 486668

PowerHouse is a registered trademark of Cognos

SIT BACK, RELAX, AND GET DOWN TO WORK.



Go ahead. Put your feet up, tilt your chair back, and pull out the latest issue of COMPUTERWORLD. No one will mind. Because you're doing your job! COMPUTERWORLD is mandatory reading for MIS-DP professionals. Indispensable.

51 weekly issues, plus 10 issues of COMPUTERWORLD FOCUS, for only \$38.95. That's over \$5 off the basic rate!

COMPUTERWORLD

Keeping Up With Today.
Anticipating Tomorrow.

Please indicate your business, function, and computer involvement below.

1. BUSINESS/INDUSTRY (Circle one)

- 10. Manufacturer (other than computer)
- 20. Finance/Insurance/Real Estate
- 30. Medicine/Law/Education
- 40. Wholesale/Retail/Trade
- 50. Business Service (except DP)
- 60. Government – State/Federal/Local
- 65. Public Utility/Communications
- 70. Systems/Transportation
- 70. Mining/Construction/Petroleum
- 80. Manufacturer of Computers,
- Computer Related Systems or Peripherals
- 85. Computer Service Bureau
- Software Planning/Consulting
- 90. Computer/Peripheral Dealer/Distributor/Retailer
- 75. User
-
- 95. Vendor
- Other _____

2. OCCUPATION/FUNCTION (Circle one)

- 11. President/Owner/Partner/General Manager
- 12. VP/Assistant VP
- 13. Treasurer/Controller/Financial Officer
- 21. Director/Manager/Supervisor DP/MIS Services
- 22. Director/Manager of Operations/Planning/Admin/Serv
- 23. Systems Manager/Systems Analyst
- 31. Manager/Supervisor/Programming
- 32. Manager/Methods Analyst
- 35. QA/WP Director/Manager/Supervisor
- 38. Database Comm./Network/Systems Mgmt
- 41. Engineering/Scientific/R&D/Technical Mgmt.
- 51. Manufacturing Sales Reps/Sales/Marketing Mgmt.
- 60. Consulting Management
- 70. Medical/Legal/Accounting Mgmt.
- 80. Educator/Journalist/Librarian/Student
- 90. Other _____

3.C

Fill out and mail in the attached postage-paid envelope.

Please enter my subscription to COMPUTERWORLD at the low Special Introductory Rate of just \$38.95 for 51 issues — a savings of \$5 off the basic rate. Plus, I'll receive the COMPUTERWORLD FOCUS issues FREE with my subscription.

- Payment enclosed
- Charge my credit card
- Bill me
- AmEx
- VISA
- Mastercard

卷之三

RECEIVED
MAY 11 1968
FEDERAL BUREAU OF INVESTIGATION
U. S. DEPARTMENT OF JUSTICE

THE JOURNAL OF CLIMATE

TITLE

COMPANY ADDRESS

CITY STATE ZIP

Address shown: Home Office

I'm already a subscriber, but I'd like to extend my subscription at this special rate. (Attach mailing label above.)

Canada, Central & South America \$110 / Europe \$165 / All other countries \$245 (Airmail).
Foreign orders must be prepaid in U.S. dollars.

COMPUTERWORLD

WELLCOME Research here... place in envelope and seal securely

Basic Rate: \$44

3317-8633

AI progresses slowly toward corporate user mainstream

Technology ready, buyers hesitant

By Eddy Goldberg

PHILADELPHIA — The wait for artificial-intelligence technology to enter the corporate user mainstream continues, with no immediate end in sight.

The latest evidence was last week's AAAI-86, the Fifth National Conference on Artificial Intelligence, where corporate users were few and far between. More than 100 vendors did exhibit, but their promises to link with mainstream computing fell primarily on the ears of developers and academics.

However, there are definite signs of progress. In the keynote address, Herbert Schorr, who heads up IBM's AI efforts, gave the technology a strong vote of support for commercial applications.

"The technology is essen-

tially ready now," said Schorr, group director of products and technology for IBM's Information Systems and Storage Group.

However, he emphasized that it will be knowledge systems combined with existing data processing systems that produce what he termed the second wave for AI.

Money-saving application

Schorr said IBM's San Jose, Calif., manufacturing facility developed an expert system in eight months designed for storage system testing. That application is expected to save the company \$5 million a year worldwide, he added.

However, Schorr cautioned users not to attempt too much with expert systems at first. "Find things that give you a good payoff that you can do rather quickly" and build from there, he suggested.

William Kania, manager of

the AI marketing group at Digital Equipment Corp., said, "While we're excited about AI technology, we don't want to be carried away with it. AI is only the next step in data processing." He added that users do not want to abandon their traditional means of computing.

One corporate user remained unconvinced that AI can presently address mainstream data processing needs. "Vendors are in a scramble to say they can do something with the IBM world, large and small," said Ralph T. Shuey, senior research associate with Chevron Oil Field Research Co. in La Habra, Calif. But after searching the offerings on the show floor, he concluded, "Not many have yet."

Shuey, who has been working with symbolic processing machines for the past 2½ years, said the biggest barrier he has experienced in

bringing AI into mainstream computing concerns the issue of computers as workstations vs. centralized computer systems. "Much of AI comes from people with workstations that they own or access on a network. The world I have to port AI to is very centralized," he said.

Michael L. Schneider, vice-president of technology research at Manufacturers Hanover Trust Co. in New York, said that although AI has moved from science to engineering in the past two to three years, he wants to run expert systems on the machines he does business with, IBM mainframes.

"I'd like to be able to develop on a symbolic processing machine with LISP for its development power and turn around and deliver it on a cost-effective environment," Schneider said. The key is cost-efficiency, he added, whether on a personal computer or a mainframe. "Am I

going to get a return on my investment?" he asked.

Corporations unconvinced

Another hurdle AI is facing in entering the marketplace is that in many corporations it is still an educational, missionary sell; it will remain so until users are convinced it can offer real solutions to everyday commercial problems and can run on their existing hardware and software.

"There is a major learning curve you have to go through before you see how to use these tools. It's really not apparent to corporate people," said independent application developer Ron Ortscheid of Ortron Development Corp. in Buffalo Grove, Ill.

"I had some difficulty before I came to the show seeing how I could use this technology," he said. "But I suspect that once you cross that learning curve, you'll find it valuable."

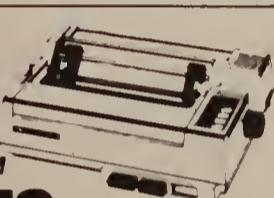
YOUR TEXAS INSTRUMENTS SOURCE

1-800-221-1127

201-376-4242 518-465-1700
203-932-6383 609-829-7280
212-662-0060 617-965-7590



SPECIAL DEALER PROGRAM



855 Printer

PRINTERS
Model 810RQ Work-Horse of the Industry
Model 820RQ-KSR
Model 850-855 Draft & Letter Quality
Model 860-865 Draft & Letter Quality
Model 880 350 cps
Model 703-707 Portable Terminal
Travel Mate Portable Terminal

COMPUTERS
Business Pro
Professional Computer—Desk Top

WESTWOOD COMPUTER CORPORATION

Authorized Dealer for NOVELL AT&T ZYXEL Esprit intel

IF YOU NEED MAINTENANCE ON YOUR NEC PRODUCTS, YOU DON'T HAVE TO CALL ON STRANGERS.

You only have to call our toll-free number to get the location of your nearest NEC Customer Engineering Service Center. The people who certainly aren't strangers to NEC printers and Astra and APC systems. Because these are the only computer products they work on.

Every one of the more than 80 locations can offer you a choice of maintenance contracts at competitive prices. Plus genuine NEC parts, accessories and supplies. And, if you ever need it, training.

Call 1-800-325-5500.

NEC
NEC Information Systems, Inc.

© 1986 NEC Information Systems, Inc.

C&C Computers and Communications

Carnegie Group upgrades expert systems tools, adds interactive graphics package

PHILADELPHIA — The Carnegie Group last week announced Version 3.2 of Knowledge Craft, its software development environment for constructing expert systems.

Knowledge Craft enhancements include upgraded performance for OPS and Prolog as the result of improved compilation techniques, the addition of macro functions and improved debugging.

The company also announced two new products along with Version 3.2 — an interactive graphics package for creating two-dimensional screen images and a run-time LISP version of Knowledge Craft. Both are set for the second-quarter availability.

In addition, the Carnegie Group will introduce Knowledge Craft on conventional 32-bit workstations by the end of the year, specifically, on Digital Equipment Corp.'s Microvax-based AI workstation and the Hewlett-Packard Co. Series 9000 Model 320. Ports are also being built to Sun Microsystems, Inc.'s Sun-3 workstation, Apollo Computer, Inc. workstations and IBM's RT Personal Computer.

"Many 32-bit workstations have reached the point where they are, in many ways, competitive with specialized AI machines," said Carnegie Group President Larry Geisler.

Carnegie also will introduce two knowledge-based tools for embedding AI within conventional data processing applications.

The low-end product will run on a personal computer, be written in the C programming language and include a compiler and editor.

The second, upwardly compatible product, will include extended knowledge-representation and inference capabilities for solving larger problems. It will include a SQL-like interface to allow expert systems to directly access information stored in popular commercial relational data bases and allow conventional programs to access its knowledge bases.

These products will be released in multiple languages

beginning with C and Common LISP and will run on IBM mainframes and DEC minicomputers as well as on the IBM RT PC and Sun-3. They will provide a migration path to Knowledge Craft.

In addition, Carnegie is developing software products for computer-integrated manufacturing that will combine conventional programming and AI techniques.

"What Lotus 1-2-3 did for accounting, these packages are designed to do for a production environment," Geisel said.

— Eddy Goldberg

ALUMINUM Disc Pack Cases • Mag Tape Reel Cases



#5142
DATA MODULE CASE
13348
Data Module
or equivalent.



#5140
DISC PACK CASE
CAPACITY —
1 3336 Disc Pack
3 Phoenix Cartridges
3 5440 Cartridges
5 2315 Cartridges



#5125
1 to 10 Canisters
#5126
1 to 14 Thinline
#5127
1 to 18 Tapeseal
or EZ-II



#5110
1 to 5 Canisters
#5115
1 to 7 Thinline
#5120
1 to 9 Tapeseal
or EZ-II

See your local dealer, or call/write —

ALUMINUM

3333 W. 48th Pl. • Chicago, Illinois 60632

CASE CO.

(312) 247-4611

DIVISION OF BY-LO MFG., INC.

Burroughs strengthens commitment to IBM compatibility

Bridge, PC emulator BTOS windows to bow

By Alan Alper

NEW YORK — Burroughs Corp. last week unveiled a trio of products enabling its family of B25 workstations and its XE 520 shared resource processors to communicate better within IBM shops.

At a New York press conference, Burroughs unveiled a bridge enabling documents created on its B25s and XE 520s to be exchanged with IBM workstations running its Distributed Office Support System (Disoss).

The company also announced an IBM Personal Computer emulator that allows Burroughs B26 and B28 workstations to run application programs written for use under Microsoft Corp. MS-DOS and a windows product for B25 family workstations running its BTOS multiuser, multitasking proprietary operating system. All three products will be available beginning in September, according to Burroughs.

Burroughs said its new products reinforce the commitment it made one year ago to providing increased IBM compatibility for its users.

"These are checklist items you have to have in office automation," said Louis Giglio, a market research analyst with Bear, Stearns & Co. in New York. "Burroughs is incredibly

late, though, with the bridge. Even Hewlett-Packard Co. and Wang Laboratories, Inc. already have one."

LeRoy W. Beers, Burroughs vice-president of the Distributed Systems Group, noted that the firm has been successful penetrating IBM accounts despite its products' lack of IBM compatibility. Approximately 30% of the 130,000 B25 family workstations shipped to date are operating within IBM-dominated shops, he said.

'Should make us stronger'

"We've been successful without a good bridge to IBM," Beers said, noting previous communications centered on IBM 3270 emulation. "These products should make us even stronger," he added.

The bridge, called OFISbridge, allows word processing documents or other files created on B25 workstations and XE 520 shared resource processors to be integrated within Disoss, IBM's mainframe-based OA system. OFISbridge, priced at \$2,300, uses a BTOS Systems Network Architecture (SNA) gateway and Burroughs' implementation of LU6.2 to access the distribution and library services provided by Disoss.

OFISbridge converts documents to IBM's Document Content Architecture and Document Interchange Architecture. It uses menus based on the IBM Displaywriter's Electronic Document Distribution System. Burroughs workstations using OFIS-

bridge do not require additional software or modifications to existing software to communicate with an IBM host, the firm noted.

The B25 cluster workstations can access the OFISbridge and SNA network gateway via a standard cluster line. All BTOS files residing on B25 workstations can be exchanged with other B25 systems or Disoss workstations through the Disoss host, Burroughs noted.

The IBM PC emulator module snaps onto the logic unit of B25 workstations and enables the processors to run IBM Personal Computer AT software packages. The Intel Corp. 80186-based unit, priced at \$1,145, has 768K bytes of internal memory and Phoenix Software Associates, Ltd. read-only memory BIOS for compatibility under MS-DOS 3.1.

Asked why it took so long for Burroughs to offer MS-DOS compatibility for the workstations, considering the IBM PC has been the de facto standard for the last three years, Michael

Brewer, Burroughs' general manager of workstations and office systems, said it was a matter of priorities.

"There were a number of things we wanted to do with BTOS so it would be a better solution for the small business environment, rather than application solutions that followed PC compatibility," he said.

Bear, Stearns' Giglio said the PC emulation module should hold Burroughs B25 customers in line. "It won't get them any incremental sales but most likely will preserve the base they already have."

BTOS Windows enables B25 family workstations to create up to 10 overlapping and variable size windows. It allows concurrent operation of a Disoss session from one window, an MS-DOS application in another and a BTOS application in a third, Burroughs said.

Prices for the package range from \$250 for a stand-alone workstation to \$375 for a version for clustered workstations.

DG: Upgrade 'delay' strategic

By Donna Raimondi

Data General Corp.'s dual-processor version of the MV20000 superminicomputer, announced in November 1985 with a 120-day shipping date, has just begun reaching customers in the third quarter. The Westboro, Mass.-based company denied the delays are due to problems and said it is encouraging customers to fully utilize single-processor versions before converting them to the more powerful model.

Rumors persist that the Model 2 version of the top-of-the-line MV20000, which was originally scheduled for delivery 30 days after the Model 1 uniprocessor, which had a February shipment date, is only now shipping because of problems with processor chips as well as the operating system.

But Tom West, DG's systems division vice-president, said that the system is shipping according to plan, that it has no hardware or operating system problems and that DG had planned all along to ship the uniprocessor model first and then upgrade as customers needed the dual-processor Model 2.

Installation slows delivery, report says

In a July report, New York investment firm Salomon Brothers, Inc.'s Marc Shulman wrote that customers who had ordered the Model 2 were supplied by DG with a Model 1 instead. Complexities in installing the larger system are slowing down delivery dates, the report said. In the absence of a proven dual processor, DG's competitive position against Digital Equipment Corp.'s Vaxcluster is weakened, the report claimed.

A customer who received the dual-processor upgrade to his MV20000 in mid-July said that reports of faulty equipment or software are wrong. "We haven't had any problems with it," said Dennis Peck, senior vice-president of Professional Hospital Services, a division of American Medical International, which provides information processing products to 157

hospitals. "The Model 2 was a little late getting here," Peck said, but it is the "most robust hardware and software that we have ever received from DG, and we've been using their products since 1980."

Peck said he received his Model 1 in April and the Model 2 upgrade in mid-July.

"We have had very few problems running customer applications on the Model 2," said Jan Pieter Scheerder, DG's director of performance analysis for customer benchmarking. "Most of the problems really come from people getting used to a dual-processor architecture and what happens to an environment when you do that."

Taking advantage of a dual processor means special planning and scheduling, Peck said. "You have to think through which jobs you can run in parallel to get peak performance." DG is installing Model 1s in customer sites that order Model 2s until that customer's Model 2 configuration is optimized at DG's facilities, a DG spokesman said.

"That was really the expectation all along," West said. "We probably were not explicit about the fact that we thought a prudent way to lead our customers was to install a single I/O channel first and then to upgrade to multiple I/O channels. But that has been our customer and account strategy all along. . . . We don't tend to put those strategies in press releases."

A part of the perceived problem with the dual processors, according to DG's Scheerder, is customer expectations. The dual-processing architecture benefits performance only on jobs that require multiple processing or in shops running jobs concurrently. "If you have a single-threaded job that only runs on one processor by its very nature and design, a dual processor is not going to do anything for you," he said. "And a dual processor is not going to give you a boost if you haven't utilized the full capacity of the first processor. So again, we have to manage those expectations."

*Everyone,
MIS and
end-users,
together build
commercial
systems faster
and easier
with the
PowerHouse®
development
language*

COGNOS

In the U.S. call 1-800-4-COGNOS
In Canada call 1-613-738-1440
In the U.K. call +44 344 486668

**is for
everyone**

World Digest

Japan tech mart weakens

TOKYO — The recent bankruptcy of a major Japanese office equipment venture, Miroku Keiri Co., provides another signal that the lucrative Japanese market is deep in the throes of transition. Analysts forecast that the big industry names, including Fujitsu Ltd., NEC Corp. and IBM, will increasingly use their financial and technical muscle to take control of Japan's office marketplace.

Miroku's collapse, the largest to date for a Japanese venture firm, sent shock waves through the domestic industry because of the firm's fast-paced growth in the last decade, pushing it toward becoming a \$149 million-a-year vendor of terminals and software. "We are at a loss how to respond to this completely unexpected failing," said a spokesman for the Taiyo Kobe Bank, one of Miroku's partners.

W. German DP jobs on rise

MUNICH — The demand for data processing professionals increased dramatically in West Germany during the first six months of 1986. Companies published about 7,000 job listings in West German trade journals during the first half of the year, up 40% from the same period last year, according to employment counselors SCS-Personalberatung.

According to an SCS report, software and system houses need qualified DP personnel. Recruitment companies, most of which are in the data processing area, report an intense demand for computer professionals.

During the previous 12 months, DP recruitment dropped off, but companies are now trying to beef up their staff. Computer-aided design and manufacturing specialists, who display the highest growth rate of any professional category, may find more than twice as many openings than during this time last year.

Asia latches onto HP RISC

HONG KONG — Hewlett-Packard Co. has sold its first HP 3000/930 reduced instruction set superminicomputer in Asia. Hong Kong is expected to be the first Asian 3000/930 site, with two machines destined for a pair of government technical institutes opening this fall.

In Malaysia, an unspecified user — believed to be another government training institute — will take a third 3000/930 supermini later in the year, and a Taiwan textile manufacturer will upgrade its existing HP 3000 by the beginning of 1987.

The total value of the four sales is estimated at \$3.5 million. HP has also received an order for its HP 3000/840 technical Spectrum, from Tokai University in Japan.

Rated at the equivalent of 4.5 million instructions per second on a complex instruction set computer, the

3000/930 will rank as Hong Kong's most powerful processor in the education sector.

Japan's telecom decline

TOKYO — Japan's telecom gear output in May grew only 1.5% from a year ago to \$883.2 million in value, owing to a 19.7% decline in export contracts during that month, a recent industry report said. Because of the bullish Japanese yen against the U.S. dollar, the shipment to the U.S. was hit hardest, decreasing 37.8% annually. Imports also dipped 15.8% to \$18.5 million.

NTT goes on U.S. field trip

TOKYO — Nippon Telegraph and Telephone Corp. (NTT) sent a 14-member mission to the U.S. to study expert system applications at major local firms, including Digital Equipment Corp. and Boeing Co. During its 13-day stay, starting Aug. 10, the NTT delegation was also scheduled to attend a Dataquest, Inc. seminar on artificial intelligence and an AI show in Philadelphia.

Robotics healthy in Japan

TOKYO — Japan's robotics production in 1985 rose 18.5% to 48,490 units, up from a year ago. According to a recent Japan Industrial Robot Manufacturers' Association report, the dollar value of last year's output was also up 21.3% to \$1.95 billion. The growth was attributed to a sharp hike in demand from the automobile and precision machinery industries. Deliveries to those industries rose to 7,600 and 2,600 units, respectively.

IBM in Australia doghouse

MELBOURNE — IBM has angered users in Australia and New Zealand by greatly increasing the price of an enhanced CICS performance analysis tool.

Users claim the price hike is too high, regardless of the enhancements, and, rather than pay the extra, they are evaluating equivalent third-party software packages. IBM's CICS performance analysis tool, CICS Pars/MVS is intended to accompany its most recent CICS/OS/V 1.7 release. It reportedly costs 10 times as much as its predecessors, CICS/Pars and PA II.

Borland ranks No. 1 in UK

LONDON — Borland International, Inc. jumped to the top slot in UK business software sales for June 1986, according to Softsel Computer Products, Inc. UK ratings.

Borland's Turbo Prolog captured the No. 1 position, outselling Lotus Development Corp.'s 1-2-3 and Ashton-Tate's Multimate.

In addition, Borland's Turbo Pascal was listed third and its Sidekick held fifth place among the top 10 business software products for the month.

Turbo Prolog, Borland's first artificial intelligence product, shipped in April of this year. By May 31, less than two months later, more than 30,000 copies had been sold worldwide.

In spite of price cuts, decline of IBM PC seen on horizon

By David Bright

Although IBM has reduced the direct sales price of its basic Personal Computer by as much as 22%, the corporate market seems unimpressed. The cuts, which come on the heels of dealer price reductions in July and retail price reductions in April, further indicate that the end is near for the 5-year-old PC, observers say.

The price reductions were made ostensibly to combat the large number of lower priced clones that have been stealing market share from IBM. But the PC has a "limited life span" and may be phased out by year's end, comments Raymond Falls, an associate editor at Datapro Research Corp. in Delran, N.J. He claims IBM is simply trying to clear its inventory of the older machines. Compared with the PC, "the XT is much better designed, has more slots and uses fewer chips, so it's a little cheaper to make," Falls says. "Since you can buy the XT now without a hard disk drive, there is really no need for the PC."

However, an IBM spokesman indicates otherwise. "We are still manufacturing these models and obviously still marketing them," he says.

The spokesman says the price reductions were made to bring parity to direct sales prices and those offered

by dealers.

"It's very encouraging that the price is coming down, but I don't want one," states Cheryl Currid, manager of sales, systems, planning and information at Coca-Cola Foods, a division of Coca-Cola Co. in Houston. With outdated features like a 4.77-MHz Intel Corp. 8088 microprocessor, five expansion slots and a 65W power supply, the PC is "not an acceptable business computer," Currid says. "The problem with the PC is that IBM has the slowest IBM compatible on the market," Currid quips.

Echoing Currid's views, the information services manager at a Michigan manufacturing corporation says his company has never purchased PCs and now requires Personal Computer AT-level power in many cases. For typical office applications, such as Lotus Development Corp.'s 1-2-3, the PC simply is not fast enough, he says.

The price cuts took effect on Aug. 1 and became public last week. The price of a PC with 256K bytes of memory and two floppy disk drives, formerly \$1,995, was reduced 20% to \$1,595; the price of the same model with one floppy disk drive dropped 22% from \$1,845 to \$1,445, and the price of a 64K-byte PC with no disk drives fell 16% from \$1,390 to \$1,165.

WYSEpc 286 is the AT-Compatible microcomputer that gives you more.

Buy, lease or rent from MTI



The WYSEpc 286 gives you the highest value in a PC-AT class microcomputer. You get more performance, more standard features and better styling.

To begin with, the WYSEpc 286 is based on the 16-bit 80286 processor and runs at a fast 10MHz to outperform the newest 8MHz IBM PC-AT and many other compatibles by 25%.

Then, look at what is standard on the WYSEpc 286 and typically cost extra on competitors' products: 640K memory, serial and parallel ports, MS-DOS 3.1 operating system with GW-Basic, and a choice of either IBM PC-AT style or IBM Enhanced PC style low-profile keyboards.

And the WYSEpc 286 easily runs the toughest programs, such as Lotus 1-2-3 and Flight Simulator, as well as hundreds of other packages, including Symphony, WordStar, the PFS: series, GEM, Autocad, SCO Xenix, and many more.

MTI is an authorized distributor of WYSE and can give you a demonstration of any of the powerful combinations of the WYSEpc 286. Call today.

The following are registered trademarks:
WYSEpc 286 for Wyse Technology, IBM Personal Computer AT for International Business Machines Corporation, Lotus 1-2-3 for Lotus Development Corporation, MS, GW, XENIX and Flight Simulator for Microsoft Corporation, PFS for Software Publishing Corporation, GEM for Digital Research, Inc. Autocad for Autodesk Inc.

WYSE

MTI SYSTEMS CORP.
A SUBSIDIARY OF DUCOMMUN INCORPORATED

Computer & Data Communications Equipment
Sales / Leasing / Service / Systems Integration

New York:	Massachusetts:	Pennsylvania:	California:	Kentucky:
212/226-2337	617/932-3876	412/931-9351	818/883-7633	502/499-6656
516/621-6200	New Jersey:	Illinois:	714/220-6487	
518/449-5959	201/227-5552	312/773-2300	Ohio:	OR CALL
718/767-0677			216/464-6688	800/645-6530

VIEWPOINT

EDITORIAL

MIS and the Macintosh

The occasion of last week's Macworld Expo in Boston and the announcement of products by Ashton-Tate and Microsoft Corp. for the Macintosh present a handy opportunity to assess the system's status 30 months after its spectacular debut. Our conclusions are twofold.

1. The Macintosh has not been the runaway success that would knock IBM out of the personal computer ring, as some top Apple Computer, Inc. officials actually predicted in January 1984. (For the record, it was the most vocal of those officials, Steve Jobs, who was knocked out of said ring.)

2. Failure to achieve No. 1 has not meant that the Macintosh has dropped out of sight. On the contrary, the machine has a legion of adherents, and their corporate ranks appear to be growing.

Apple's problem with marketing the Macintosh to business users has always been its failure to give enough of these users a sound reason for buying the machine. Corporate users are looking for tools and solutions; the Macintosh offered neither and instead struck many as an overly indulgent technical plaything. The Macintosh was too slow, offered little available software, did not connect with other machines and had a closed architecture.

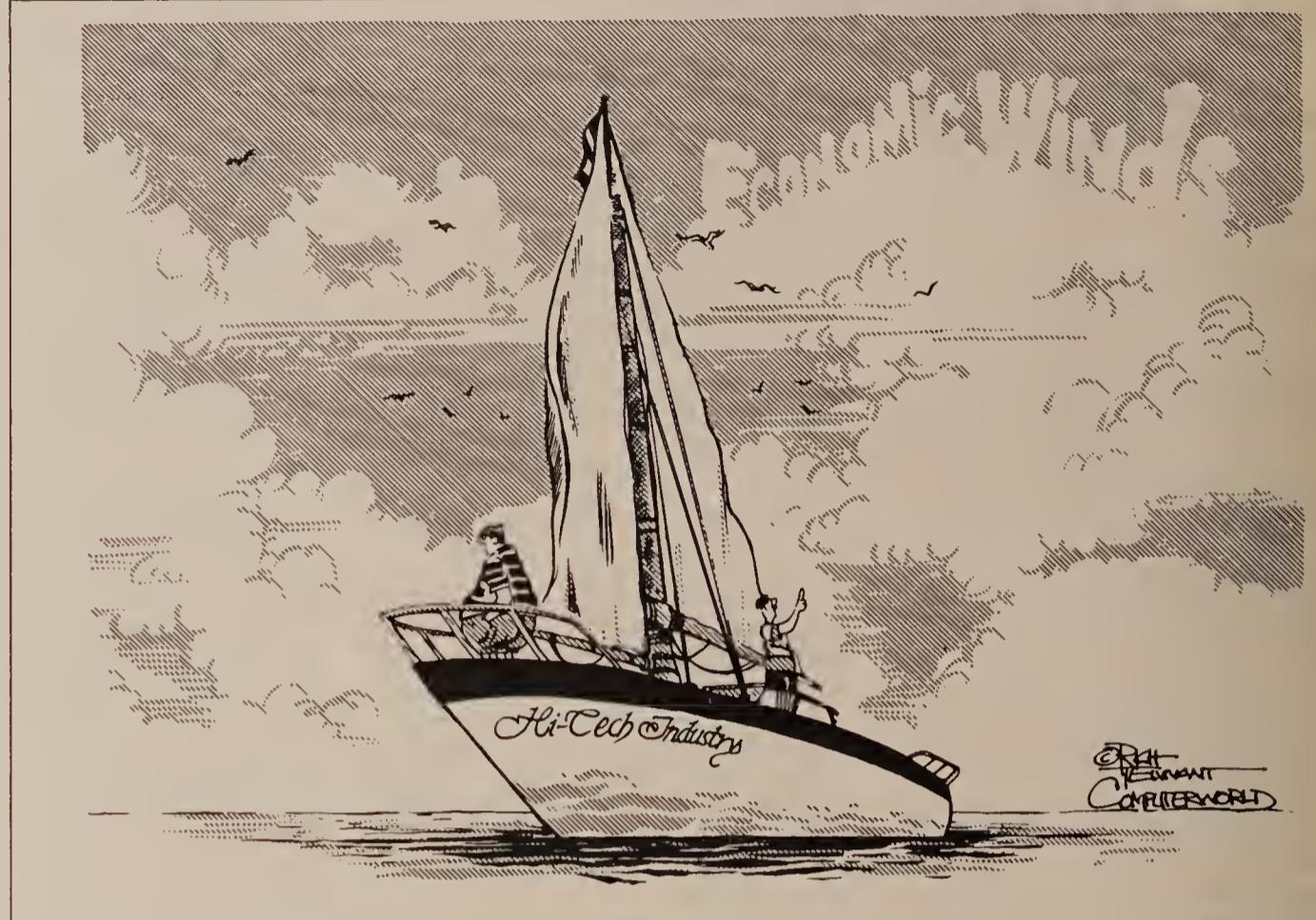
Much of this has changed, is changing or will soon change. The original 128K-byte machine has been upgraded, first, to 512K bytes and then to the 1M-byte Macintosh Plus, which is faster than standard 640K-byte personal computers. The software shortage has been resolved, in some cases (vide Microsoft's Excel) impressively so. Connectivity tools exist, notably 3Com Corp.'s Ethermac, though not yet in profusion. And closed architecture solutions — namely IBM PC-DOS and Unix capabilities — have been promised by Apple for a year and are now said to be scheduled for release at next January's Apple stockholders' meeting.

Meanwhile, corporate computer uses have become more diversified and corporate computer managers more sophisticated. These developments are not without their irony, as they pertain to the Macintosh and MIS. It now appears that the very DP/MIS executives whom Apple depicted as the enemy incarnate when the Macintosh was unleashed in 1984 may turn out to be the system's most effective champions within the corporate computing world.

At the time the Macintosh debuted, DP/MIS was scrambling to get control of the rapid proliferation of PCs within their organizations. With this objective largely achieved, and the majority of PCs installed as word processing and spreadsheet tools, information systems managers have been able to turn their attention to other areas of computing need.

While not abandoning their push for Macintosh connectivity and compatibility, they are better able now — having established an organizationwide information management strategy — to appreciate the Macintosh's technical virtues, to define a specific role for it within the corporation and to promote it as a desktop publishing solution or a low-end engineering workstation.

Apple's corporate battle on behalf of the Macintosh is far from over. But the prospects for a significant victory are far rosier now than at any time in the past 30 months.



LETTERS TO THE EDITOR

No representation in true democracy

A recent letter to the editor, "Computers give power to the people" [CW June 30], discussed the use of computers to enhance democratic participation by citizens.

Technically, the form of government in the U.S. is a republic, not a democracy. This means that the citizens elect persons to represent them in enacting federal law: people who understand the complexity of the issues, political maneuvering and the funding bills to which the writer refers. The framers of the Constitution realized that citizens were not sufficiently informed to make choices on each and every piece of legislation.

Even in today's society, with dramatic advances in communication, citizens have little hope for understanding the complexity of more than a few of the major issues. Also, one of the functions of any government is to protect its citizens, including minorities. A republic is best equipped to perform this function because the representatives act on behalf of a larger population, including minorities.

The writer is advocating a true democracy in which each person has a direct voting impact on the legislative process; the notion of representation in a republic is gone.

Also, the opportunity to amend legislation before passage is gone. True democracies are characterized by a sense of every man for himself, mob rule and tyranny of the majority. The protection of citizens becomes very difficult.

It is true that computers have great potential for disseminating information regarding legislation. Some possibilities are informing citizens of current legislation, informing citizens of the voting track records of representatives and electronic mail for citizens to express opinions to representatives.

But for the reasons stated above, a true democracy (computerized or not) is alarming, and a

"democratically computerized world government" is highly dangerous.

Bob Farnham, Director
Computing Services and Systems
Graceland College
Lamoni, Iowa

Multiuser system 'close, but no cigar'

In regard to Mr. Kapsales's Reader's Platform, "Limited technology must take blame for current PC slump" [CW July 28], I can only echo the old carny cry of "close, but no cigar." A lack of technology is probably to blame for the slumping personal computer sales. And, Kapsales does indeed identify (if not clearly and explicitly) the lack of clean and simple methods to share information. His response, the multiuser machine, is incorrect.

The one-CPU-per-user principle has some very definite advantages:

- Reliability — a fault affects only one user, not a group, and the PCs I have used have all been more dependable than the mainframes and minis.

- User knowledge — there are now many users who can use PCs, bringing end-user needs, knowledge and experience to the solution of business problems. The various programs for the PC have proven track records in the areas Kapsales lists as being of most interest. This is not true of the multiuser systems.

- Flexibility — in two important respects. The user can configure a system to answer specific needs, not accept a generic solution. And for the first time since the late Middle Ages, a user can work with the tools and in the manner best suited for him, while still producing output that is acceptable to and usable by all.

The lack of technology is what defines flexibility. We still do not have the products that will allow users to pass information easily and cleanly. And until we do, the PC market will probably remain flat. If the best solution that arrives is the IBM 17-layers of separately purchased and paid-for products, the market may never recover.

Kapsales's solution is to scrap the PCs and reinvest in multiuser hardware. That may appeal to a Big Eight consultant or to someone who wants to push end users out of controlling computing resources, but it is not the best way for a company, or an industry, to prepare for the changes ahead.

Steven Newton
Shorewood, Wis.

Computerworld welcomes letters and publishes those it judges of greatest interest to its readers.

Preference will be given to typed, double-spaced letters of fewer than 150 words.

Letters become the property of Computerworld and may be edited for the purposes of clarity and brevity.

Letters should be addressed to the Editor, Computerworld, Box 9171, 375 Cochituate Road, Framingham, Mass. 01701-9171.

VIEWPOINT

Chips for brains: Computers built with neural networks

When was the last time you got hold of a brain? I'm not talking about somebody overly smart, or even sweetbreads. I'm talking about a brain, as in cerebellum and gray matter.

Most of us never think about brains, unless we deal with people who have none. But if the research community has its way, the next generation of computers will be modeled on the actual physical structure of the human brain.

In the last year, a number of research laboratories around the country have been rallying behind the concept of semiconductor brain duplication, or neural networks. The activity has been triggered in particular by success stories from researchers at Johns Hopkins University and AT&T Bell Laboratories.

Neural networks vs. linear architecture

And now, with recent announcements from both Texas Instruments, Inc. and TRW, Inc. that they are getting ready to commercialize neural network technology, people are saying the next big thing is to get rid of our standard, linear, von Neumann architectures.

Simply stated, neural networks are attempts to physically reconstruct the brain with semiconductor technology. Connections between chips are patterned after nerve cell interconnections via dendrites and

synapses. Instead of linear connections, the individual processors have multiple, three-dimensional connections and are able to access the appropriate neighbor chip (located above, below, next to or diagonally), according to need. In effect, each chip strives to exist as both a single autonomous unit and as an integral component of the complete machine.

This means that each chip can take separate but mutually beneficial paths to solve different pieces of a problem simultaneously, thus avoiding the bottleneck that occurs when processing is done linearly, or one step at a time. An added benefit is that if certain processors break down, other functioning processors can work around them and even pick up their work load.

In theory, this sounds wonderful for the future of all types of computing. Read on.

Let us start by examining what TRW is doing with neural networks. The company has introduced a commercial version of a machine it developed under contract to the Department of Defense called the Mark III Artificial Neural System Processor.

The Mark III costs \$53,000 and uses a Digital Equipment Corp. VAX as its host system. The machine can have as many as 8,000 "neurons" and utilize roughly 500,000 interconnections.

Compare this with the almost 10

billion neurons in the brain, which have an estimated 10 trillion interconnections. With the current Mark III packaged in a box that is 24- by 18- by 12-in., a portable TRW version of a fully configured brain would probably be the size of Cleveland.

However, the focus of using the neural network is not really the same

as that of mainstream computing. The systems we currently utilize on a daily basis are merely efficient calculators. They do one thing that humans are not good at — number crunching.

This takes on forms that are primarily adult in nature: accounting cost-modeling, storing facts, controlling inventories and so on.

However, computers have never been capable of the kinds of things that children are good at (and which become second nature in adults), such as learning, utilizing senses, making cognitive associations and combining unrelated experiential data to produce new data.

The senses, in particular, are where computers fail to compete. Why? That is easy enough to answer by picking one of the senses — sight — and comparing its components with those used by machines, based on data such as the following from the University of Toronto's Playfair Neuroscience Unit: While the retina requires .0001W, a product with integrated circuits needs at least 200W. A retina weighs less than one gram,

its machine counterpart more than 20,000 grams. Retinal gates total 25 billion vs. the chip-based product's one million. Finally, lead traces in the retina are fewer than three microns, those in a chip-based product, 250 microns.

As you can see, we are not quite there yet.

Hope to mimic sensory communication

Neural network machines hope to change the current state of affairs by utilizing the multiple-access, multiple-processor approach in mimicry of brain cell and sensory communication. At least that is what researchers hope will happen. You see, nobody knows how sensory communication works; nobody even knows how the brain works. And relative to neural networks and their brain-like architectures, it has been surmised that this undertaking is akin to building a model of a bird and expecting it to be able to fly and make little birds.

This is not deterring some researchers from looking into the possible production of the machines for use throughout the commercial market. New designs are under way at such institutions as Brown University, California Institute of Technology, Carnegie-Mellon University, University of California at San Diego, TI, AT&T and even IBM. The TRW machine is just the first to come, and bets are that there will be more.

And as these organizations start to move their man-made brains out into the world, you cannot help but think that Victor Frankenstein would be proud.



By HARVEY P. NEWQUIST

Newquist writes and consults on artificial intelligence and other advanced high-technology topics from his office in Scottsdale, Ariz.

Balancing technical perfection and political realities

The report of the Rogers commission on the shuttle disaster contains important lessons for everyone in data processing — indeed, for anyone involved in an enterprise revolving around technology.

The very high stakes of the National Aeronautics and Space Administration's mission made for the extreme situation that so often reveals interorganizational conflict in sharp relief.

Looking past the specifics of the Rogers report — the details of O-rings' seals on the booster rocket and who said or did not say what when — one sees that the report documents an all-too-human phenomenon: the tendency to buy harmony at too high a price, to dismiss unpleasant nay-sayers as Chicken Littles.

Additionally, the report reinforces research that has repeatedly found technologists to be a fairly conservative lot who are quite unenthusiastic about dissenting noisily — in public.

Technical folk, it would seem, only blow the whistle when every other warning device has gone unheard.

One of the problems the report describes is a variation on the timeless sales vs. engineering conflict. The folks in sales are usually impatient for new products they know are coming, fearing that the windows of opportunity they see open may shut on them prematurely. In this case, the sales staff was NASA's own top-level executives, its congressional and other political supporters and its vendors and suppliers.

At the same time, engineering almost always wants more time to perfect the product, to tweak it a bit more, to add more value or more reliability. Programmers and engineers can become too attached to their creations, losing sight of the forest for the trees.

Everyone in DP, whether on the management or technical side, learns about this conflict early on in their careers. DP professionals believe disaster will ensue if they are not given more time to debug, tweak and enhance their systems, whereas the op-

posing group wants the product made available yesterday. This is true whether the opposing group is a user department in the same large organization or the sales department of a company selling hardware or software.

In the process of dissenting, some DP staff members make themselves offensive to management. The real issue is resolving DP judgment with sales judgment and organizational needs. Studies of DP professionals and engineers seem to indicate that technologists are not alarmists and certainly not eager to stir up problems for no good reason. Unfortunately, few organizations have managed to institute adroit methods of dealing with this kind of dissent.

And many DP professionals have often not been especially adroit at using the system to redress their concerns. (Incidentally, one of the dissents in the otherwise wimpy report, written by commission member and Nobel Laureate Richard Feynman, was a stinging criticism of NASA and its contractors. Feynman's recent book, *Surely You're Joking, Mr. Feyn-*

man, is entertaining, enlightening and must-reading for anyone seeking a greater understanding of technically oriented people.)

Ignored problems do not go away

One of the points that the Rogers commission report makes, indirectly, is that ignoring problems does not make them go away. A problem ignored is a problem that is festering. Another point is that organizations need more formal processes for resolving disputes. Perhaps one answer might be organizational ombudsmen.

The technological change that is second nature to anyone working in the computer business obviously produces change in the social and organizational environments. With all that change going on around us, it is easy to fall into the trap of thinking that fundamental aspects of human behavior may have changed as well.

It is easy, too, for those who are intimately involved with technology, as DP professionals are, to become seduced by the idea of the technological fix — that technology can solve all kinds of problems.

So it is good to be reminded periodically that some problems are eternal, despite changes in the technological arena.

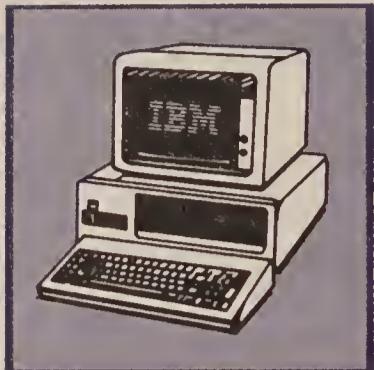


By HOWARD A. KARTEN

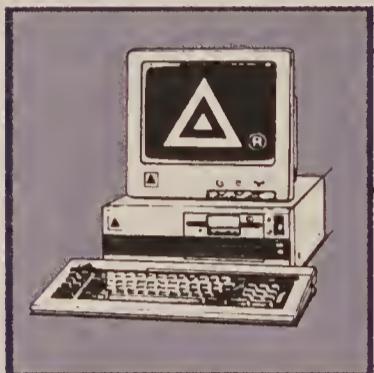
Karten has been involved with computers for two decades as a programmer, systems analyst and DP manager and is author of *How to Profit from Dow Jones News/Retrieval*.

Make the Connection

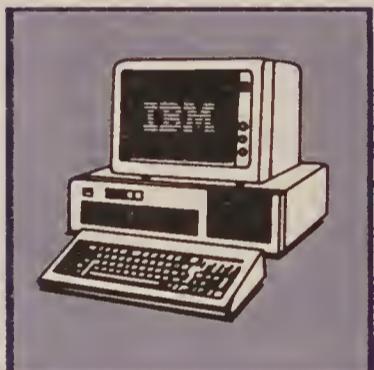
IBM PC/XT® and Compatibles



Leading Edge Personal Computers

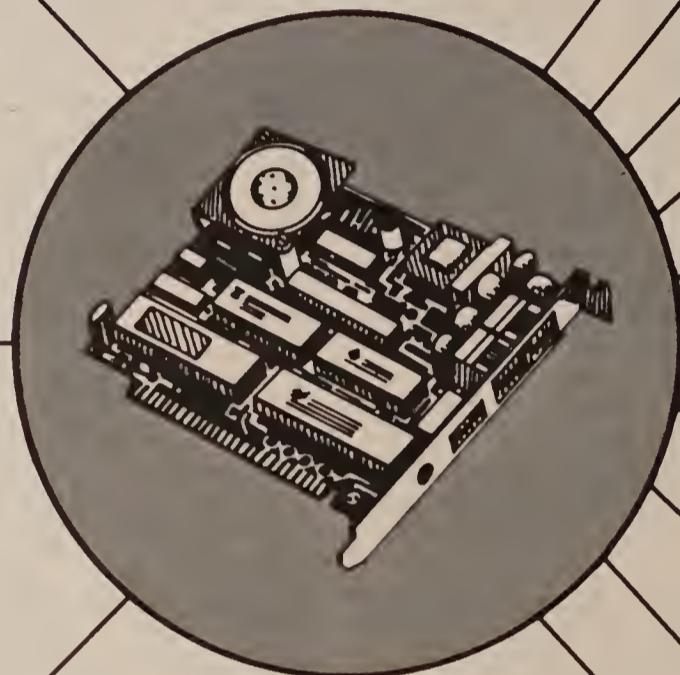


IBM AT™ and Compatibles



The Leading Edge® Model "L" Series™ Modems

Hayes® Compatible



Model "L"™	Hayes®
1200B	\$149.95
2400B	\$289.00

Leading Edge®, the first company to develop affordable IBM®-compatible personal computers, now offers the first affordable Hayes-compatible modems: The Model "L" Series™ Modems.

Like our personal computers, the Model "L" Series Modems do everything the industry standard modems do, except cost a lot.

For example, they can access databases. And databases represent what could be considered one of the largest compilations of information in the world, with data on every topic from the stock market quotes to corporate histories to the current exchange rates.

Model "L" Series Modems can send and receive data to and from personal computers all over the world. You can send electronic letters to locations all over the country or over the ocean. It's infinitely faster than conventional mail and a lot less expensive.

They allow you to use your own personal computer to send and receive Telexes.

They can also provide access to mainframes, making

your personal computer a personal work station wherever it is—in the office, at home or on the road.

And Model "L" Series Modems allow you to network with other personal computers. You can share data or share programs. You can even transfer files between two completely incompatible systems (i.e. Apples® and IBMs).

Yet at \$149.95 and \$289 respectively, the 1200B and 2400B Model "L" Series Modems are priced below equivalent Hayes Modems. In fact the Model "L" Series 1200B, including software and a 24-month warranty, is priced at one third the price of an equivalent Hayes Modem.

We're just reaffirming what we proved with personal computers. You don't have to pay a lot to get a lot.

To make the connection for yourself, call **1-800-USA-LEAD** for more information and a dealer near you, (617) 828-8150 in MA. For our special "Fleet" pricing call our Fortune Fleet Division at **1-800-457-7286**, (617) 769-8050 in MA.



Leading Edge Hardware Products, Inc.
225 Turnpike Street, Canton, MA 02021 (617) 828-8150

Leading Edge Hardware Products, Inc. Fortune Fleet Division
55 Providence Highway, Norwood, MA 02062

COMMUNICATIONS

Telcos sell cable scheme as standard

By Elisabeth Horwitt

Challenging AT&T's and IBM's inroads into the building cabling arena, divested Bell operating companies Diamond State Telephone and Bell of Pennsylvania recently announced the Universal Information Transport Plan, a wiring scheme they claim supports any brand of computer at data rates of up to 16M bit/sec.

The two Bell Atlantic Corp. operating companies hope to make the Transport Plan a de facto wiring standard, said John Balerini, marketing network architecture staff manager at Bell of Pennsylvania. "In the absence of industry standards, each system has its own wiring specifications, and when you change the system, you have to rip out the wiring. IBM, Wang Laboratories, Inc. and Digital Equipment Corp. make cabling to lock out other vendors, so people will buy their products. Customers ask us, 'Why can't we have one type of wiring?'"

Under the Transport Plan, computers and other devices are linked to existing wiring closets via shielded twisted-pair cable plugged into telephone wall jacks. A system can be unplugged from one jack and moved to another "by an ordinary user — no need to send out a technician," Balerini claimed.

Two twisted pairs are designated for high-speed data transmission. The cabling has been tested to support up to 16M bit/sec. data rates over a maximum distance of approximately 100 feet between the workstation and wiring closet. Bell of Pennsylvania now has customer sites that support 8M bit/sec. rates. "We have no 16M bit/sec. installations right now because there currently are no network products that support that speed," Balerini said.

An additional four twisted-pair wires support central office-based data and voice services such as Centrex and Central Office-LAN, a 19.2K bit/sec. data network. The wiring specifications also conform to the Integrated Services Digital Network.

See TELCOS page 20

Network managers debut, analyze traffic for basic, high-level needs

By Stanley Gibson

Two centralized network management systems announced recently target user installations at opposite ends of the spectrum. Engarde, from Doelz Networks, Inc., manages major user installations costing \$1 million or more; the 5110, from Case Communications, Inc., is an entry-level version of the Case 5000 series of management tools.

Both products collect, store and process diagnostic and traffic information from wide-area network interface devices. The network manager can thus monitor and troubleshoot the network from a central location. Both products can also generate reports on traffic patterns and usage trends for capacity planning and billing purposes.

Engarde, from Irvine, Calif.-based Doelz, is based on a Masscomp Corp. MC5500 graphics workstation with windowing capabilities. The workstation correlates information gathered with Doelz Esprit One and Elite One switches and concentrators. Network conditions are stored

in the computer at 30-sec. intervals.

The workstation can graphically display major nodes and, using a zoom feature, smaller nodes within the major nodes. The color graphics workstation runs under RTU, Masscomp's real-time Unix operating system. It features a 71M-byte, 5½-in. fixed disk.

The information is stored and accessed through Unify Corp.'s Unify relational data base management package. Visual Intelligence Corp.'s Dataviews is used for graphics operations.

According to President Frank Connors, Doelz plans to build future network management systems around high- and low-end Masscomp workstations that have not yet been introduced.

Engarde saved Seattle First National Bank from having to hire additional network management staff when it replaced an outdated network system with a \$2 million to \$3 million Doelz network, said Gary Scroggs, assistant vice-president and manager of network utilities.

See NET page 21

INSIDE

Interpath Corp. releases voice recognition system for the IBM PC family/21

NEW THIS WEEK

- GTE Supply enhances Trailblazer modem
- Brooktrout Technology offers a voice messaging system

For more on these and other new products, see pp. 75-85.

INSTANT ANALYSIS

"So far, Open Systems Interconnect protocols allow you to build a network of computers but not a computer network, because crucial resource management capabilities are still lacking."

— John Haefner, chief of systems and network architecture division, National Bureau of Standards

Micom ups networking capabilities

Expansion cards add protocols, capacity

By Elisabeth Horwitt

SIMI VALLEY, Calif. — Packet-switching and hub-networking capabilities, as well as greater power, are among the features Micom Systems, Inc. has just announced for its Micom Box multiplexer line. The company also unveiled a variable-speed dial-up modem.

Micom Box 3 is a more powerful version of its predecessor, Micom Box 2. Both products function like generic data communications devices that support a variety of networking capabilities. Additional functions can be added by inserting software Featurepaks into the expansion slots. "The user can start with a concentrator

network and go to an X.25 packet assembler/disassembler (PAD) and then an X.25 switch by simply swapping Featurepaks," said Chris Kenber, vice-president of marketing operations.

All products in the Micom Box line can support modem boards that provide AT&T Dataphone Digital Service connections. The basic Box 3, supporting four 19.2K bit/sec. channels, is priced at \$1,790 and is available now. Expansion cards supporting six channels cost \$1,250.

Micom also announced six Featurepaks, three of which support X.25 packet-switched networking functions. "The Micom Box is a cornerstone of our low-end line of X.25 networking products," said Gregory Toussant, director of X.25 products.

The asynchronous packet assembler/ See MICOM page 20

ADVERTISEMENT

ADVERTISEMENT

ADVERTISEMENT

SYSTEM 2000® DBMS for Only \$12,000

All the Extras Without the Extra Costs

You don't have to spend a bundle to get a full-function data base management system. For a first-year fee of \$12,000, SYSTEM 2000® DBMS gives you:

- an integrated data dictionary
- on-line query/update
- a report generator
- relational data base access
- programming language interfaces
- high-quality training and technical support.

Renewal rates are even lower. Plus, you can now link SYSTEM 2000 DBMS with the SAS® System of software to build data bases, store and retrieve data, merge and manipulate data, perform your analyses, and produce reports and presentation graphics. You can even give Information Center users access to your DBMS through easy-to-use SAS menus.

Before you invest a bundle, find out why SYSTEM 2000 DBMS is the most economical data base management system in the industry.

SAS and SYSTEM 2000 are registered trademarks of SAS Institute Inc., Cary, NC, USA.

Copyright © 1986 by SAS Institute Inc. Printed in the USA.



SAS Institute Inc.
Box 8000, SAS Circle
Cary, NC 27511-8000
(919) 467-8000 Telex 802505

COMMUNICATIONS

Telcos sell cable scheme as norm

From page 19

Balerini said.

The Transport Plan's high data rates "enable the customer to support IBM's 4M bit/sec. network, or Wang's 4M bit/sec. network, or a 10M bit/sec. Ethernet on the same cable," Balerini claimed.

Bell of Pennsylvania technical support people work with customers in order to tailor a building's wiring scheme to specific communications and systems needs, he added. "We will take responsibility for connecting various systems and for diagnosing problems in wiring and baluns — everything up to the communications

controller," Balerini said.

Other operating regional companies within Bell Atlantic should start offering the Transport Plan before the end of the year, Balerini said.

"AT&T does not see Bell of Pennsylvania as a competitor, because our Premise Distribution System [PDS] wiring scheme already addresses the needs of our business customers," an AT&T spokesman said.

PDS, an unshielded twisted-pair wiring scheme that supports 1M bit/sec. transmissions, "was designed to keep network prices down by allowing customers to use existing cabling," he added.

Installation costs for Universal Information Transport Plan wiring range from \$300 to \$600, according to Bell of Pennsylvania.

"Cost could become an important issue" in the battle for cabling su-

premacy, according to Lee Doyle, senior analyst at Framingham, Mass. research firm International Data Corp. (IDC) "IBM's cabling is quite expensive."

Doyle disagreed, however, with Bell of Pennsylvania's claim of offering the only "universal" cabling system around. "There is no question that a lot of different systems will run on IBM's Token-Ring and Cabling System," he commented. "And AT&T and DEC both call their cabling systems multivendor."

"What could be less vendor-specific than unshielded twisted pair?" said the AT&T spokesman, noting that PDS supports AT&T's Information Systems Network and Digital Multiplexed Interface, both of which can link third-party vendors' hosts and terminals.

"Both the IBM Cabling System and

the Token-Ring are open systems," an IBM spokeswoman said. "We have made documentation for both products available to third parties, and a number of vendors say that they are attaching their products to the Cabling System."

Earlier this year, DEC announced Decsite Services to help customers plan, design and build custom — and multivendor — installations of the Deconnect wiring system and Thin-wire Ethernet.

While admitting that "technologically and costwise, they have something," Doyle expressed doubts about the size of the Universal Information Transport Plan's potential market. "How many companies will rewire existing buildings unless they are Big Blue shops with deep pockets or have very specific data needs?"

According to an IDC survey, many firms have stand-alone hosts and a local-area network but "are skeptical of one cabling scheme that will satisfy all of their networking needs," Doyle said. "Why install a 'universal' wiring system until you're sure what it will be supporting?"

Micom ups networking

From page 19

disassembler, which conforms to the 1984 CCITT standard, is priced at \$500 and is available now. A 3270 bisynchronous PAD is priced at \$1,950 and will be available in September. This version of Micom's synchronous PAD has the ability to collect performance statistics as well as network accounting and billing information. The X.25 packet switch is priced at \$1,950 and is available now.

In the network concentrator arena, Micom unveiled the Enhanced Wideband Multiplexer, which supports 48K, 56K, 64K or 72K bit/sec. transmissions. It will be available in September for \$600. The Enhanced Synchronous Multiplexer, available in October for \$500, provides up to eight synchronous lines in addition to asynchronous channel support.

The Concentrator Switch, available in September for \$600, performs as a network hub for up to 10 Micom Box or Micro800/2 data concentrators serving up to 255 user and computer ports. The switch interconnects multiple asynchronous channels originating at different Micom data concentrators, "so that users on any Box can talk to each other," explained Byron Henderson, director of marketing for the concentrator group.

"The switch enables multiple users on multiple Boxes to communicate, without needing direct links between each pair of data concentrators," Henderson added.

Micom also announced the Modem Dial Series 3124, which handles data rates of 300, 1,200 and 2,400 bit/sec. and conforms to AT&T Bell Laboratories 103A and 212A and CCITT V.22 standards. The product also supports communications software developed for the Hayes Microcomputer Products, Inc. AT Smartmodem command set. The Microcom Networking Protocol, another standard feature, provides error checking and correction over dial-up lines. Available in September, the modem will list for \$549.



SIS HAS FOUND A NEW HOME AT DUQUESNE SYSTEMS

Duquesne Systems, a long time leader in providing software for managing shared devices for MVS and MVS/XA users, is now home for the Single Image Software product line. SIS products let you effectively manage the sharing of tape drives, DASD, and consoles, while maintaining data integrity.

MSM works to effectively manage the allocation of tape devices across all systems in your multiple CPU complex. MSM allows normal operations with all devices on line to all systems. MSM provides for truly natural and transparent shared device management.

MSI works in a multiple CPU environment to share DASD, maintain dataset integrity, and eliminate reserve lockouts. MSI provides the same thorough dataset protection for jobs executing in multiple CPUs that exists when jobs execute on a single CPU.

GCD consolidates all console messages into one dataset and then provides the ability to selectively transmit them to consoles that are functionally designated. The blended message stream creates a unified system image and provides for a more streamlined operation.

Let MSI, MSM, and GCD work together for you to achieve a true single image for all the shared disk, tape and console devices in your complex. SIS can effectively manage shared devices simplifying operations. You save time and money.



**DUQUESNE
SYSTEMS**

(800) 527-7050
(201) 946-7700 In NJ

COMPUTERWORLD. It's indispensable!

Please enter my subscription to COMPUTERWORLD at the low Special Introductory Rate of just *\$38.95 for 51 issues, a savings of \$5 off the basic rate! Plus, I'll receive the COMPUTERWORLD FOCUS issues at no extra charge.

Bill me. Payment enclosed. Address shown: Home Office

FIRST NAME	M I	LAST NAME
TITLE		
COMPANY		
ADDRESS		
CITY	STATE	ZIP

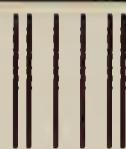
* U.S. only.

1. BUSINESS/INDUSTRY (Circle one)
10. Manufacturer (other than computer)
20. Finance/Insurance/Real Estate
30. Medicine/Law/Education
40. Wholesale/Retail/Trade
50. Business Service (except DP)
60. Government — State/Federal/Local
65. Public Utility/Communications Systems/Transportation
70. Mining/Construction/Petroleum/Refining/Agriculture
80. Manufacturer of Computers, Computer-Related Systems or Peripherals
85. Computer Service Bureau/Software/Planning/Consulting
90. Computer/Peripheral Dealer/Distributor/Retailer

75. User Other _____
95. Vendor Other _____
2. OCCUPATION/FUNCTION (Circle one)
11. President/Owner/Partner/General Manager
12. VP/Assistant VP
13. Treasurer/Controller/Financial Officer
21. Director/Manager/Supervisor DP/MIS Services
22. Director/Manager of Operations/Planning/Admin. Serv
23. Systems Manager/Systems Analyst
31. Manager/Supervisor Programming
32. Programmer/Methods Analyst
35. OA/WP Director/Manager/Supervisor
38. Data Comm. Network/Systems Mgmt

41. Engineering/Scientific/ R&D/Technical Mgmt
51. Manufacturing Sales Reps/Sales/ Marketing Mgmt
60. Consulting Management
70. Medical/Legal/Accounting/Mgmt
80. Educator/Journalist/Librarian/Student
90. Other _____
3. COMPUTER INVOLVEMENT (Circle all that apply)
Types of equipment with which you are personally involved either as a user, vendor or consultant.
A. Mainframes/Superminis
B. Minicomputers/Small Business Computers
C. Microcomputers/Desktops
D. Communications Systems
E. Office Automation Systems

3217-8633



NO POSTAGE
NECESSARY
IF MAILED
IN THE
UNITED STATES

BUSINESS REPLY MAIL

FIRST CLASS MAIL PERMIT NO. 55 SOUTHEASTERN, PA 19398

POSTAGE WILL BE PAID BY ADDRESSEE

COMPUTERWORLD

CIRCULATION DEPARTMENT
BOX 1016
SOUTHEASTERN, PA 19398-9984



COMMUNICATIONS

Interpath system allows PCs to recognize voice commands

By Eddy Goldberg

SANTA CLARA, Calif. — Interpath Corp. recently introduced Voicecommand C25, a \$199 voice recognition system that allows a reported 99.9% accurate verbal operation of most programs written for the IBM Personal Computer and compatible machines.

Voicecommand allows the PC to recognize and accept the user's voice as an alternative to keyboard entry of commands and data, according to Interpath President John McAfee.

Users can define common commands like Load File, Print and Create Graph, which remain in the system for future use with any software package. Common verbs, nouns, numbers and names also can be defined as voice commands.

'Powerful tool'

"Voice recognition is a very useful and powerful tool, but it has been out of the reach of individual PC

users," McAfee said. "Putting the price below \$200 opens up the capability to almost everyone."

McAfee said the reported 99.9% accuracy is the result of Voicecommand's front-end signal processor, which has a very high noise filtering capability and gives a much cleaner signal than most available systems.

Interpath has developed a new architecture in which the recognition process is done in software using standard IBM PC hardware, McAfee noted.

Translates spoken word

The software intercepts the keyboard interrupts and translates the spoken word into a series of up to 1,000

user-defined keystrokes per word or command, according to McAfee.

Voicecommand's menu option enables users to define voice menus that can be used as substitutes for the usual on-screen menus.

Voice menus can be linked so that one voice command, such as Graph, will automatically load the next set of

choices, such as Pie, Bar or Line.

The Voicecommand system includes a half-size add-on board, software, a microphone and an instruction manual.

It is available now to run on the IBM PC, Personal Computer XT and AT and requires 64K bytes of main memory.

UNITED STATES DISTRICT COURT SOUTHERN DISTRICT OF OHIO WESTERN DIVISION

UNITED STATES OF AMERICA,
Plaintiff,
v.
THE NATIONAL CASH REGISTER
COMPANY, et al.,
Defendants.

In Equity No. 6802
NOTICE OF MOTION TO
TERMINATE FINAL DECREE

Judge Walter H. Rice

TAKE NOTICE that NCR Corporation ("NCR"), formerly known as The National Cash Register Company, a defendant in this action, has filed a motion for an order terminating as to all defendants the "Final Decree" in this action, which was entered on February 1, 1916. The plaintiff, the United States of America, has consented to the entry of such an order, but has reserved the right to withdraw its consent for at least seventy (70) days after the publication of this notice.

The complaint in this action, which was filed in 1911, alleged that NCR and 28 individual defendants were engaged in a conspiracy to restrain trade, an attempt to monopolize and a successful monopolization of the cash register industry through a variety of anticompetitive practices, including corporate espionage and below-cost pricing. The Final Decree enjoins NCR and 17 individuals from, among other things:

- (1) persuading a purchaser of a competitor's cash register to break his contract;
- (2) espionage upon a competitor for the purpose of obtaining the names or addresses of purchasers or prospective purchasers or other information and using such information to dissuade any persons from purchasing a cash register from the competitor;
- (3) inducing any employee of any competitor to disclose the business secrets of the competitor;
- (4) inducing any employee of a competitor to leave the service of such competitor or inducing a dealer in competitive cash registers to cease to deal in such competitor's cash registers and to employ such employee or dealer;
- (5) selling any cash register manufactured by a competitor or any cash register made to resemble a competing cash register when sold not for the purpose of earning profits therefrom but for the dominant purpose of preventing sales of such competing cash registers; or selling any cash register at a price fixed with reference not to the cost of manufacture but solely with reference to the price of said competing cash register, for the purpose of driving from business the manufacturer of the competing cash register;
- (6) selling any secondhand cash register of NCR for the purpose not of realizing therefrom as much as practicable but for the dominant purpose of driving a competitor from business;
- (7) having employees whose principal duty is to prevent competitors from selling cash registers or following the salesmen or dealers of a competitor for the purpose of interfering with the competitor's sales efforts or identifying its prospective customers;
- (8) making any statement reflecting upon the solvency or responsibility of any competitor or upon the efficiency of any competing cash register when such statement is either a misrepresentation or is made for the mere purpose, not of directly promoting the sale of NCR cash registers, but of preventing the sale of competing cash registers;
- (9) intimidating competitors or prospective investors in competitors with certain types of product comparisons or statements of purported losses suffered by the competitors in their efforts to compete with NCR;
- (10) intimidating prospective purchasers of competing cash registers with suit for patent infringement;
- (11) maintaining an ostensible competitor corporation that is secretly controlled by the defendants;
- (12) acquiring ownership of any part of the business of any competitor in cash registers; NCR may, however, petition the Court to permit such acquisition.

Interested persons may submit comments concerning this matter by sending them to John A. Weedon, Chief, Cleveland and Field Office, Antitrust Division, United States Department of Justice, 995 Celebreeze Federal Building, Cleveland, Ohio 44199 (telephone: 216-522-4070). Such comments must be received by the Division within sixty (60) days.

Copies of the complaint, Final Decree, motion papers, all comments submitted and all further papers filed with the Court will be available for inspection at the Legal Procedure Unit of the Antitrust Division, Room 7233, United States Department of Justice, Tenth Street and Pennsylvania Avenue, N.W., Washington, D.C. 20530 (telephone: 202-633-2481), and at the Office of the Clerk of the United States District Court for the Southern District of Ohio, Western Division, 200 West Second Street, Dayton, Ohio 45402. Copies of any of these materials may be obtained from the Legal Procedure Unit upon request and payment of the copying fee set by Department of Justice regulations.

Based on a Convergent Technologies, Inc. 32-bit minicomputer, each 5110 can manage a network consisting of up to 30 leased telephone lines equipped with Case 4000 series modems or up to three Case DCX 840/850 communications processors, according to the company.

The 5110 processor runs the Unix operating system, the Unify relational data base manager and system management software written in the C language.

The system costs \$15,995 and will be available for delivery Sept. 1.

Net managers introduced

From page 19

Engarde's ability to uncover network problems quickly is important since "every minute of downtime costs the bank money," Scroggs said. He added that the windowing feature is particularly helpful in network monitoring.

Engarde's starting price is \$70,000 to \$85,000, depending on the customer configuration. The product is available 90 days after order, according to Doelz.

Although an entry-level system, the Case Communications 5110 network management system provides many of the same functions as the larger Case 5000 series and can be expanded as a data communications network grows, according to Reyann Carpenter, marketing manager for the Columbia, Md., company.

Based on a Convergent Technologies, Inc. 32-bit minicomputer, each 5110 can manage a network consisting of up to 30 leased telephone lines equipped with Case 4000 series modems or up to three Case DCX 840/850 communications processors, according to the company.

The 5110 processor runs the Unix operating system, the Unify relational data base manager and system management software written in the C language.

The system costs \$15,995 and will be available for delivery Sept. 1.

The Only Distributed Relational Database Solution.

Put INGRES to work in your organization. Because for the first time, you can get transparent access to all your company's data. Even if that data is located on different computers. In different locations.

THE DISTRIBUTED DATABASE.

With INGRES, you get a truly distributed database. Not just a networked system. Because INGRES is the one RDBMS that works across multiple operating environments. From mainframes to minis to micros. Whether you have a few computers or a few thousand. Which means no matter how large your organization, your data and your applications can be shared. You'll have one consistent relational view of all your data.

The key to your distributed database is INGRES/STAR. Its open architecture gives you universal access to data (supporting multiple vendors' hardware, software and networks), while preserving local control of data integrity and security. Users don't have to worry about where the data is located, how to get it or what type of hardware and operating system are used.

Which means you can build applications and share data that span multiple computers just as easily as if all the data were located on one machine. Your entire company uses one powerful DBMS with consistent, reliable results.

INTEGRATED APPLICATION TOOLS.

Only INGRES gives you a comprehensive application development environment. With a 4GL that includes SQL, a Visual Forms Editor and host language interfaces (ADA, BASIC, C, COBOL, FORTRAN, PASCAL and PL/I). You'll work in an integrated environment that gives you unprecedented productivity in application development.

Your end-users will find it easy to create forms, queries, reports and graphs, too. Because INGRES's Visual Programming tools give them the decision support capabilities they need. While reducing the MIS application backlog.

HIGH-PERFORMANCE SQL AND MORE.

INGRES's SQL is broadly compatible with IBM's DB2. So you can stay with the industry standard. And move applications easily and quickly, whenever you want.

You can also count on higher performance. INGRES is uncommonly fast. And provides special support for transaction processing and complex queries. What's

more, INGRES gives you the high levels of data security, integrity and consistency you demand.

So look into the only truly distributed relational DBMS solution. INGRES. You'll see how the INGRES advantage is the key to integrating your dissimilar computers. For more information, call toll-free:

(800) 4-INGRES

From Canada, (415) 769-1400

Relational Technology

1080 Marina Village Parkway, Alameda, CA 94501

© 1986 Relational Technology

INGRES, INGRES/STAR and Visual Programming are registered trademarks of Relational Technology. IBM and DB2 are trademarks of International Business Machines Corporation.

**JOIN US FOR A FREE INGRES SEMINAR.
CALL (800) 4-INGRES FOR A RESERVATION.**

AL	Birmingham	.....	Sep 16	MO	St. Louis	.....	Aug 19
AZ	Phoenix	.....	Oct 14	NC	Research	Triangle Park	Oct 14
		Tucson	.....			Winston-Salem	Sep 23
CA	Los Angeles	.....	Jul 17	NE	Omaha	.....	Sep 24
		Sep 25	.....	NJ	Iselin	.....	Sep 9
		Nov 20	.....	NM	Albuquerque	.....	Aug 26
CA	Newport Beach	.....	Oct 1	NY	Albany	.....	Nov 5
	Sacramento	.....	Oct 28			New York City	Sep 9
	San Diego	.....	Oct 8				Oct 21
	San Francisco	.....	Aug 12				Dec 9
		Oct 15	.....	NE	Rochester	.....	Aug 20
		Dec 3	.....	OH	Cincinnati	.....	Nov 20
		Sunnyvale	.....		Cleveland	.....	Oct 15
		Oct 1	.....	CA	Columbus	.....	Dec 10
		Nov 19	.....		Toledo	.....	Nov 18
CO	Denver	.....	Nov 11	OK	Oklahoma City	.....	Dec 4
CT	Stamford	.....	Oct 23	OR	Portland	.....	Oct 29
DC	Washington	.....	Aug 28	PA	Philadelphia	.....	Sep 16
		Nov 19	.....		Pittsburgh	.....	Nov 12
FL	Jacksonville	.....	Nov 19	TN	Nashville	.....	Nov 6
	Miami	.....	Oct 16	TX	Austin	.....	Oct 21
	Orlando	.....	Dec 16		Dallas	.....	Nov 5
GA	Atlanta	.....	Aug 26		Houston	.....	Nov 11
IA	Des Moines	.....	Nov 18	VA	Richmond	.....	Dec 11
IL	Chicago	.....	Aug 14	WA	Seattle	.....	Oct 9
IN	Indianapolis	.....	Dec 2				
KY	Louisville	.....	Sep 30				
LA	New Orleans	.....	Dec 16				
	Shreveport	.....	Dec 10				
MA	Boston	.....	Sep 24				
	Burlington	.....	Oct 2				
	Newton	.....	Dec 4				
MI	Detroit	.....	Sep 11				
MN	Minneapolis	.....	Oct 23				
MO	Kansas City	.....	Sep 18				

CANADIAN SEMINARS:

Calgary	.....	Sep 17
Montreal	.....	Sep 25
Ottawa	.....	Oct 30
Quebec	.....	Sep 10
Toronto	.....	Nov 13
Winnipeg	.....	Oct 14

INGRES. The Distributed SQL Relational DBMS.

MICROCOMPUTERS


SMALL TALK
Maura McEnaney

CD-ROM all sizzle, no steak

Last March, I started a file of clippings on compact disk/read-only memory (CD-ROM) technology. Little did I know that I had created a monster.

In four months, the CD-ROM file has grown to be the largest in my filing cabinet. Right now, it weighs in at seven pounds and takes up three inches of drawer space. I'm now thinking of building the file a home of its own.

Every time I run across that monstrous file, I can't help but ask two questions: Is CD-ROM technology really that hot? If so, why isn't there more of it out there?

Maybe we should blame the CD-ROM information overload on the computer slump. "Editors are looking for new technology, and right now, it's CD-ROM," a colleague told me recently.

It's true that the shiny compact disks have a storage capacity of 0.5G bytes and are virtually indestructible, making the write-once technology ideal for storing large, unerasable data bases.

But like a rookie who receives too much press before he's hit his first home run, CD-ROM applications are still in their infancy.

Granted, the young industry took some major strides this summer when the High Sierra Group, an ad hoc group of 13 vendors, proposed a set of standards [CW, June 23] that would permit CD-ROM disks to run across multiple operating systems. And companies designed to help both users and software developers come up with CD-ROM applications are springing up here and there.

At a recent Information Industry Association conference on CD-ROM technology, Lotus Development Corp. Vice-President Don McLagan told attendees that the success of CD-ROM will depend

See **CD-ROM** page 28

McEnaney is a Computerworld West Coast correspondent.

Group tackles productivity

Pacesetter product gauges 'intangible' contributions

By Douglas Barney

PRINCETON, N.J. — A consortium consisting of 12 corporations and a variety of U.S. government agencies teamed up with Pacesetter Software, Inc. to develop Productivity Map, a software product that measures white-collar productivity.

"I was looking for a way to break through the barrier in measuring white-collar productivity. White-collar people say their jobs are not measurable, that they are intangible. I thought anything worth doing was worth measuring," said Greg Whitney, manager of organization analysis for 3M Corp. in St. Paul, Minn.

3M, a member of the consortium, will use the \$695 Productivity Map to assist department-level managers in identifying what productivity is, identifying critical areas affecting productivity that need to be addressed by the manager and tracking

actual performance, Whitney said.

According to Whitney, Productivity Map forms a new category of software. "It is the first and only one that I know of. We haven't seen anything else on the marketplace," he said.

The major difference between Productivity Map and project management software is that Productivity Map focuses on satisfying the customer's requirements, Whitney said. Project management software, however, is aimed largely at managing project schedules and expenses.

The program is interactive and asks the user a variety of questions to clarify the organization's objectives, examine internal activities, identify key customers and understand their objectives and select an appropriate performance measurement for their department.

With graphics and data management facilities, managers can track their department's progress.

The product runs on IBM Personal Computers and compatibles with a minimum of 256K bytes of random-access memory.

INSIDE

Lotus contracts with encryption developer to design security system/**26**

Grid Systems announces E-mail for local or remote access/**28**

Maple Systems International offers aid in evaluating software packages/**28**

NEW THIS WEEK

■ Toshiba America upgrades its IBM-compatible portable PC

■ For more on this and other new products, see pp. 75-85.

INSTANT ANALYSIS

"The issue in the future is not integrating micros into the world of minicomputers and mainframes, but how do minis and mainframes justify their existence."

— William Zachman, International Data Corp. corporate vice-president of research at Software Publishing Corp.'s introduction of its improved PFS: line

T/Maker will market Next's Apple software

By Douglas Barney

PALO ALTO, Calif. — Next, Inc. has licensed T/Maker Co. to market its \$175 Writenow word processing package for Apple Computer, Inc.'s Macintosh. T/Maker Co. will ship the product in October.

Next, which acquired the package through the purchase of Solaster, Inc. earlier this year, was founded by former Apple Chairman Steven Jobs to develop high-end products for the academic market. "We bought a small company from Seattle called Solaster. We acquired them specifically because we wanted to acquire the programmers," said Dan Lewin, manager of sales and marketing for Next. "We are not in the business of selling Mac software."

T/Maker, on the other hand, is in the business of selling Macintosh software. "There is a need for an easy-to-use word processor, but with very powerful capabilities," said Lewin.

See **T/MAKER** page 26

IBM expands maintenance list

By David Bright

IBM announced recently that it will provide maintenance service for 33 additional non-IBM products and introduced a memory expansion board and two modems. In addition, IBM introduced a 70M-byte fixed disk drive for the RT Personal Computer.

The additional non-IBM products brings the total number of non-IBM, PC-related products supported to 83. In June, Big Blue took a similar step and added support for 17 non-IBM products.

IBM increased its support offerings "as a convenience to our customers to broaden the range of IBM support available to them," said spokeswoman Dale Bennett. The support offerings were part of a series of announcements earlier this month.

The newly supported products include peripherals and add-on boards from four vendors: Amdek Corp., Hayes Microcomputer Products, Inc., Hewlett-Packard Co. and AST Research, Inc. The majority of the items are various AST add-on boards. Depending on the type of service chosen, annual minimum maintenance charges range

See **IBM** page 26

Attention dBASE III developers!

INTRODUCING GENIFER. A FULL-FUNCTION APPLICATION GENERATOR THAT CAN SLASH DEVELOPMENT TIME.

Here's a special no-risk offer.

Just call the toll-free number below or send us a check for just \$395! We'll rush you the full Genifer package, complete with 190 page manual, sample tutorial data, a tutorial version of Genifer, and the sealed product disk. If you're not completely delighted, return the material (including the sealed product disk) within thirty days of shipping. We will promptly refund your money—no questions asked.

If you want to give users the highest quality programs in the shortest amount of time, you need Genifer—a remarkable dBASE III application generator that saves you time and money.

Want to create superb code in minutes, not weeks? Genifer delivers. Interested in creating high-quality prototypes in under an hour? You need this revolutionary product.

Genifer is a trademark of Bytel Corporation.
dBASE III is a trademark of Ashton-Tate.

We urge you to act now. Don't miss seeing for yourself how Genifer can provide a total programming solution for you.

Call toll-free:

800-631-2229

In California:

800-541-3366

Locally:

(415) 527-1157

Telex:

176609

bytel

or write:

bytel corporation

1029 Solano Avenue, Berkeley, CA 94706

YES, I'd like to see for myself how Genifer can slash development time and make my life easier. So send it to me for just \$395, subject to your money-back guarantee. My check is enclosed.

Name _____

Company _____

Address _____

City _____

Phone () _____

State _____

Zip _____

California residents add sales tax. Price includes UPS shipping to all U.S. cities.

© Copyright 1986

Bytel Corporation

Achieve Full Integration For Your Corporate PC... With The SAS® System Under PCDOS.

One Integrated Solution For All Your Company Needs.

Now, you can have an information system that offers solutions for all of your company's needs. Data management and retrieval. Statistical analyses. Report writing. Applications development. And

more. All in one product.

And you can use it in every department and for every application. Data entry. Business reports. Text processing. Statistical summaries. With the PC SAS® System, decision-making, record-keeping, and analysis are standard and simple.

One Solution With Complete And Powerful Features.

The same high-quality software for mainframes and minicomputers is now available for PCs. And it offers features as rich as any mainframe system you've seen. A data manager. A full-screen text editor.



A windowing facility. Complete data manipulation and statistical procedures. A display manager (to edit, display and control output from your PC). An interactive programming facility. A front-end menuing system that you can customize. With the PC SAS System, you get the power of the mainframe and minicomputer SAS System. And more.

One Solution For Your Micro-To-Mainframe Link.

Now, you can link your PC to your mainframe. With the same system at both ends of the link. You can download data to your PC. Or develop and test applications on your PC. The PC SAS System reads data from programs like dBASE II, dBASE III and LOTUS 1-2-3. You can enter data on your PC, submit your job to the mainframe, execute it, and view the results on your PC. Or you can download data from the mainframe, add and

revise, and send the new data to the mainframe for job execution or storage. Regardless of which system you use, the language, syntax and commands are identical.

One Solution That Is Remarkably Friendly.

Now, one system offers special features like programmable "pop-up" windows that make "friendly" a term you can understand. Use these windows to program function keys. To create "help" messages. To check the variables in your data set. And these windows can handle practically any utility you need. In fact, the PC SAS System is so friendly anyone in your organization can use it.

One Solution With Site Licensing And Full Support.

At last, you can have the information system for your PC you've always wanted. With the advantages of site licensing. You

license the PC SAS System on an annual basis. You get all updates automatically. And at no additional cost.

The PC SAS System is also fully supported. Documentation accompanies delivery. Technical support is provided by phone or mail. Full customer training is offered. And it's all available from SAS Institute.

The Solution For SAS Power On Your Corporate PC. Now.



SAS Institute Inc.
Box 8000, SAS Circle
Cary, North Carolina 27511-8000
Telephone: (919) 467-8000, ext. 280
Telex: 802505 SAS RAL



MICROCOMPUTERS

Lotus contract with RSA Data Security in works

By Peggy Watt

CAMBRIDGE, Mass. — Lotus Development Corp. is expected this week to announce that it has licensed RSA Data Security, Inc. of San Carlos, Calif., to develop an encryption system for a new Lotus product.

Lotus and RSA would not disclose details of the system, but RSA specializes in

data security for network transmission. The company has done similar development work with other companies involving the protection of data communications files. RSA has a license for encryption system development with the U.S. Navy.

Lotus was unavailable for comment at press time.

The system RSA will de-

velop for Lotus will be based on the RSA standard algorithm, which allows the user to check for file authenticity and verify the author of an encrypted program through a binary number generation program, according to an RSA spokeswoman.

The Data Encryption Standard is part of the RSA standard but includes additional

verification features, she said.

The spokeswoman said the contract is a multiyear agreement and may eventually involve more than one Lotus product.

RSA's encryption method creates a digital seal, or signature code, that can be decrypted by a public key, or binary numerical password.

IBM adds products

From page 23

from \$30 to \$275.

If a PC system carries an IBM warranty option or maintenance agreement, all of its add-on boards not under original warranty must be included in an IBM maintenance agreement, IBM said.

For customer carry-in repair, the maintenance charge for the Amdek 310-A monochrome display is \$30. Annual maintenance fees for the Hayes Transet 1000 multifunction buffer begin at \$65. The on-site exchange fee for HP's 7550A color graphics plotter is \$275.

AST cards supported include I/O Plus II, Preview, Rampage, Rampage-AT, Ramvantage and Fourport. Annual fees for these boards are between \$35 and \$110.

Memory on the multifunction Memory Expansion Adapter ranges from 512K bytes to 3M bytes. Prices start at \$595; each additional 512K-byte module costs \$165.

The board includes a parallel printer port and an asynchronous serial communications port.

Both modems operate at 2,400 bit/sec. and support full-duplex mode. The stand-alone 5842 modem is priced at \$719. The 4829 half-length, 2,400 bit/sec. modem card is priced at \$569.

The 70M-byte ESDI Fixed-Disk Drive and Magnetic Media Adapter for the IBM RT PC support the proposed Enhanced Small Device Interface standard. The new drive replaces the previously announced 70M-byte Fixed-Disk Drive and carries a price of \$3,995; the adapter is priced at \$650.

The expansion board and modems should be available this month. Scheduled availability for the RT PC disk drive and controller is Sept. 26.



What is the best feature of a Paradyne multiplexer?

Worldwide service organization

A Paradyne networking multiplexer has everything a stat mux should have, plus responsive service from a worldwide network of over 800 people. And 24-hour support. You get a complete family of reliable, flexible multiplexers. From 4 channels to 240. Right up to T1. Call Susan Ricker to find out more.

1-800-482-3333

paradyne

Paradyne Corporation
P.O. Box 1347 8550 Ulmerton Rd.,
Largo, FL 33540

T/Maker to market tools

From page 23

ties, like Microsoft Corp.'s Word. We have automatic footnotes, a variety of headers and footers, a 50,000-word spell checker and unlimited windows. We have word processing that is as easy to use as Macwrite but is much faster than Microsoft's Word," said Royal P. Farros, T/Maker's vice-president of sales and marketing.

Next has not yet brought any product to market. Its scholarly workstation will not be offered until at least next year, Lewin said.

MANTIS® 1981

"Cincom application tool slashes development time."

Source: Computerworld, January 19, 1981

Now Available
For IMS/DC Users.

MANTIS 1982

"MANTIS has paid for itself many times over in programmer productivity and end-user satisfaction."

Source: Jay Lazarre, V.P. for MIS, Pellerin Milnor

MANTIS 1983

"Performs like COBOL, with the productivity of a true 4GL — and used for all new, on-line development."

Source: Tony Liberoni, Manager of Operations and Systems, PPG Industries Chemical Group

MANTIS 1984

"100% of our new on-line development is in MANTIS."

Source: Luther Perry, D.P. Director, Santa Cruz County, CA

MANTIS 1985

"MANTIS is the international on-line application development standard for General Foods."

Source: Fred Lambrou, International Director of Information Services, General Foods International

MANTIS 1986

The Best Just Got Better.

Proven in over 2,000 user sites, MANTIS, from Cincom®, is the premiere fourth generation application development system.

And, now the best is even better. Our major new release of MANTIS gives you even greater performance and productivity.

With MANTIS, you can prototype, refine, test, and release an application for production in a single, interactive session. Compile-free MANTIS applications are fast, and easy to develop and maintain. And MANTIS provides such high performance that many users make it their standard for all on-line applications.

MANTIS portability lets you move applications — **without change** — from one operating environment to another. From VSE to MVS. From CICS to IMS/DC. Even from one hardware system to another, including IBM®, DEC™ VAX™ Wang VS®, NCR® VRX and others. And MANTIS provides support for multiple data structures, such as VSAM, DL/1, SQL/DS, SUPRA™ and others.

To see just how much better MANTIS really is, **compare it to any other system** you're using or evaluating. For a demonstration or more information, call the toll-free number below. In Ohio, call 513-661-6000. In Canada, 416-279-4220.

1-800-543-3010.



CINCOM

IBM is a registered trademark of the International Business Machines Corporation.

DEC and VAX are trademarks of Digital Equipment Corporation.

World Headquarters • 2300 Montana Avenue • Cincinnati, Ohio 45211

Wang VS is a registered trademark of Wang Laboratories, Inc.

NCR is a registered trademark of NCR Corporation.

MICROCOMPUTERS

The Choice does legwork in software decision

By David Bright

BETHESDA, Md. — Maple Systems International now has a program that aids in the evaluation of software packages. Called The Choice, the \$100 package is targeted at managers and consultants involved in choosing applications for systems ranging from personal computers to mainframes.

Twelve templates are separately available for evaluating the following types of applications: accounts payable, accounts receivable, data base management systems, capital projects, general ledger, word processing, payroll, personnel, purchase order, fixed assets, financial modeling and fourth-generation languages.

The templates cost from \$25 to \$50. Users can also create their own evaluation templates.

The templates will save managers time and effort. "We are doing the laborious and tedious homework of poring over user manuals, company brochures and industry reports to determine what is the state of the art in each of these applications," said Jim Cooper, president of the start-up company. "Users of The Choice can eliminate this research and use the template as a base on which to develop their own evaluations."

Although the software does not contain information about specific vendors' packages, it allows the user to compare a package's features with

a list of as many as 500 features crucial to a particular type of application. The average mainframe application has between 50 and 250 requirements to be checked, and the typical microcomputer application has fewer than 50 requirements, Cooper said. Each feature is accompanied by a 100-word description.

For each type of application, the user weights and scores up to seven vendor packages; The Choice then summarizes and ranks each package. It can calculate and rank 450 requirements for seven vendor packages in less than 1 sec. The Choice requires an IBM Personal Computer or compatible with 256K bytes of memory and two floppy disk drives.

Grid releases LAN E-mail

By Peggy Watt

MOUNTAIN VIEW, Calif. — Grid Systems Corp. last week announced Field Mail, an electronic mail system for use on a local-area network or for remote access by users with laptop computers in the field.

The Field Mail package runs on the Grid Server, providing a maximum of 164 mailboxes for sending or receiving messages, according to a Grid spokesman. The Field Mail software package costs \$3,125.

The corresponding software for each participating remote or local terminal is \$75, and it runs on a Grid-case laptop system and IBM Personal Computer or compatible desktop computers. It is available immediately.

With the system, a user can assign a priority to each message sent, similar to postal service designations. First class calls for immediate delivery; second class, for delivery when a second message is sent to the same person. Third class ensures delivery upon availability of the server. Third-class mail may also be sent at off-peak times when one is using a time-sharing system or standard telephone lines linking servers.

The user can also send the same message to multiple recipients and set standing distribution lists. The Field Mail application is available immediately.

As many as 30 servers can be linked and electronic mail can be sent among them. The number of messages stored is limited only by server storage, which ranges from 10M bytes to 40M bytes.

The server is priced at \$12,950 for a system with 10M bytes of storage and \$15,300 for 40M bytes of storage.

CD-ROM all sizzle, no steak

From page 23

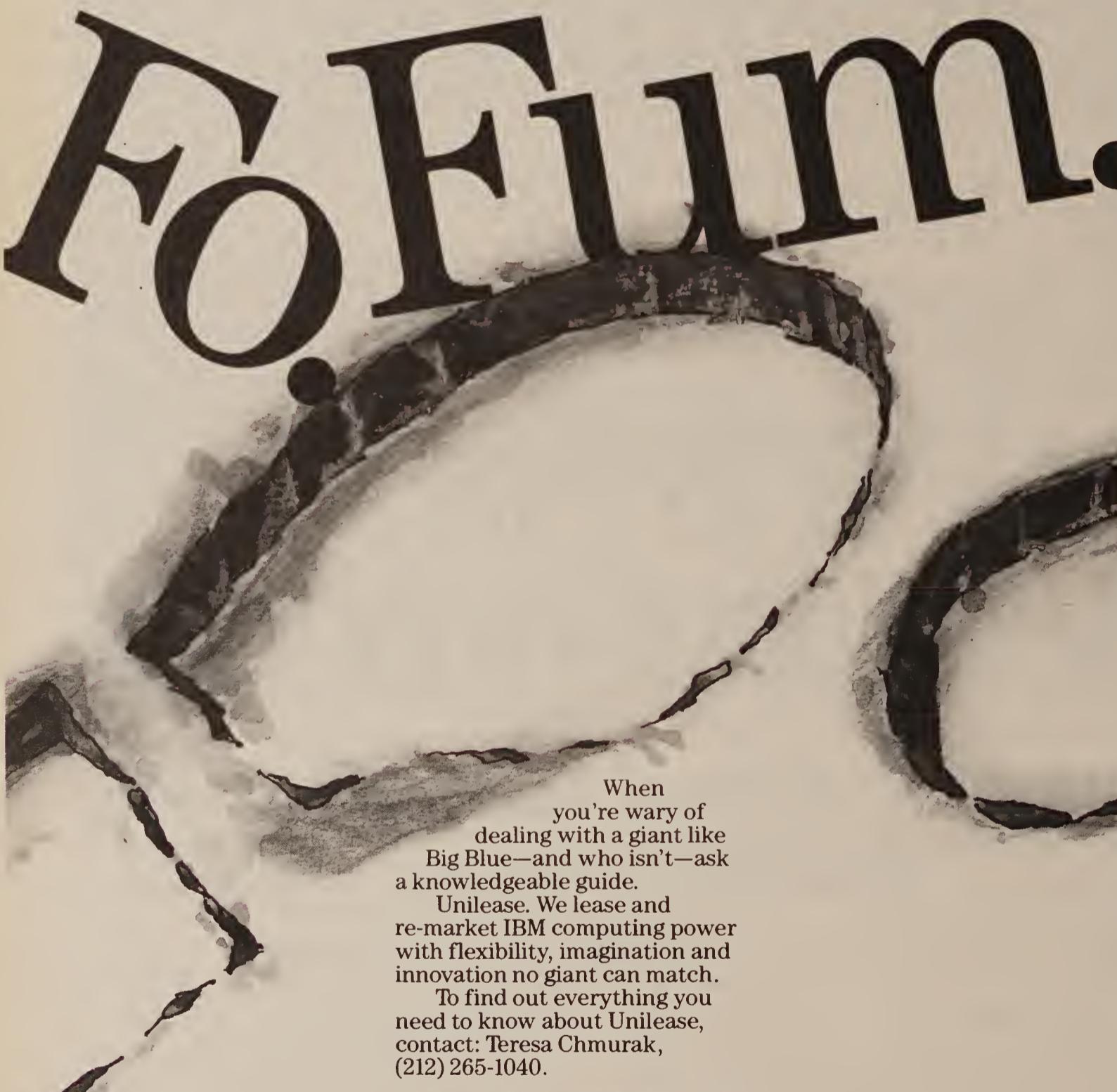
on its ability to clear several major hurdles, the first of which is the price of the hardware.

In its current form, CD-ROM is too expensive, McLagan pointed out. The compact disk readers that are needed to access a CD-ROM data base now cost about \$2,250. As a result, many vendors are bundling the cost of the CD-ROM readers with their individual data bases.

Vendors are taking a hard-sell approach to CD-ROM, McLagan said. "We must make it immediately apparent to the end user what the capabilities of CD-ROM are," he added.

But exactly who that end-user will be remains to be seen. Will the responsibility for CD-ROM players fall under the jurisdiction of MIS managers, whose purchasing responsibilities have in some cases widened to include even telephones? Or will CD-ROM fall under the jurisdiction of the Information Center?

Unless some of those questions are answered, the seven-pound file I've started will grow heavier with more stories that only ponder the practicality of CD-ROM.



When
you're wary of
dealing with a giant like
Big Blue—and who isn't—ask
a knowledgeable guide.

Unilease. We lease and
re-market IBM computing power
with flexibility, imagination and
innovation no giant can match.

To find out everything you
need to know about Unilease,
contact: Teresa Chmurak,
(212) 265-1040.

Please send me a copy of "Everything
you need to know about Unilease." CW

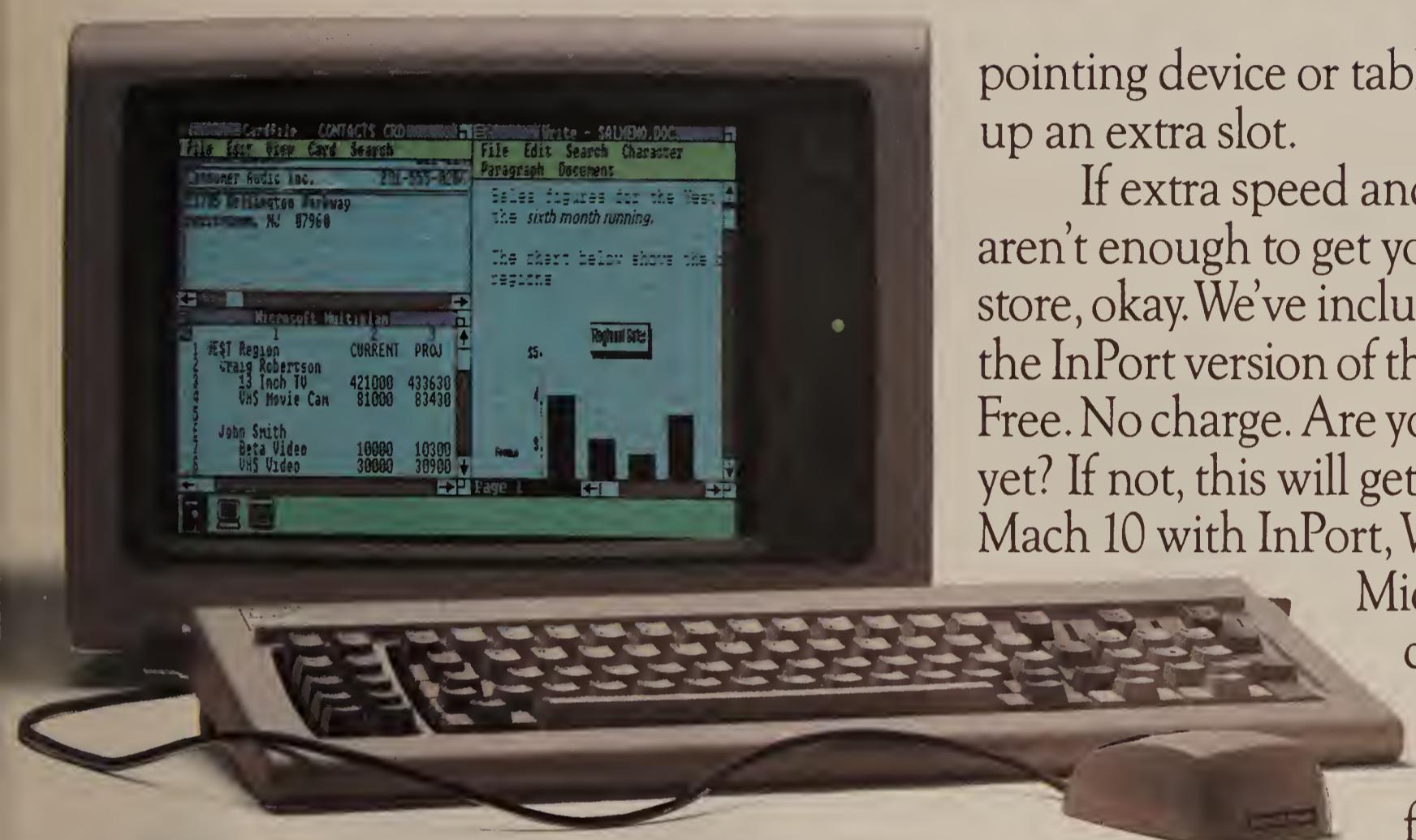
Name _____
Title _____
Company _____
Street _____
City _____ State _____ Zip _____

Unilease Computer Corporation
1370 Avenue of the Americas
New York, NY 10019
ATTN: Teresa Chmurak

 UNILEASE

(212) 265-1040 New York Orlando Los Angeles London Düsseldorf Paris

Save \$3000 on Windows.



If you thought you needed a PC AT to get the speed to take maximum advantage of Microsoft® Windows, cancel your order. You can get a Microsoft Mach 10 for about \$3000 less than an IBM® PC AT.

Microsoft Mach 10 is a hardware performance enhancer. Your own IBM PC or IBM PC XT can go up to twice as fast when you're running Windows and Microsoft Word or other favorite applications.

Speed isn't all you get, though. Microsoft's exclusive InPort™ Device Interface, the new graphic input device standard, is built into Mach 10. Use our new InPort version of the Microsoft Mouse or any other compatible

pointing device or tablet without using up an extra slot.

If extra speed and an extra port aren't enough to get you hurrying to the store, okay. We've included Windows and the InPort version of the Microsoft Mouse. Free. No charge. Are you out of your chair yet? If not, this will get you moving: The Mach 10 with InPort, Windows, and the

Microsoft Mouse costs only \$549.

Now, take a look around and try to find a better value.

If you're wondering why we're offering all this together, don't forget who we are: Microsoft. The inventor and developer of software used by more people than any other. That means we've learned the kinds of things that will help you get the most out of your computer. And your mind.

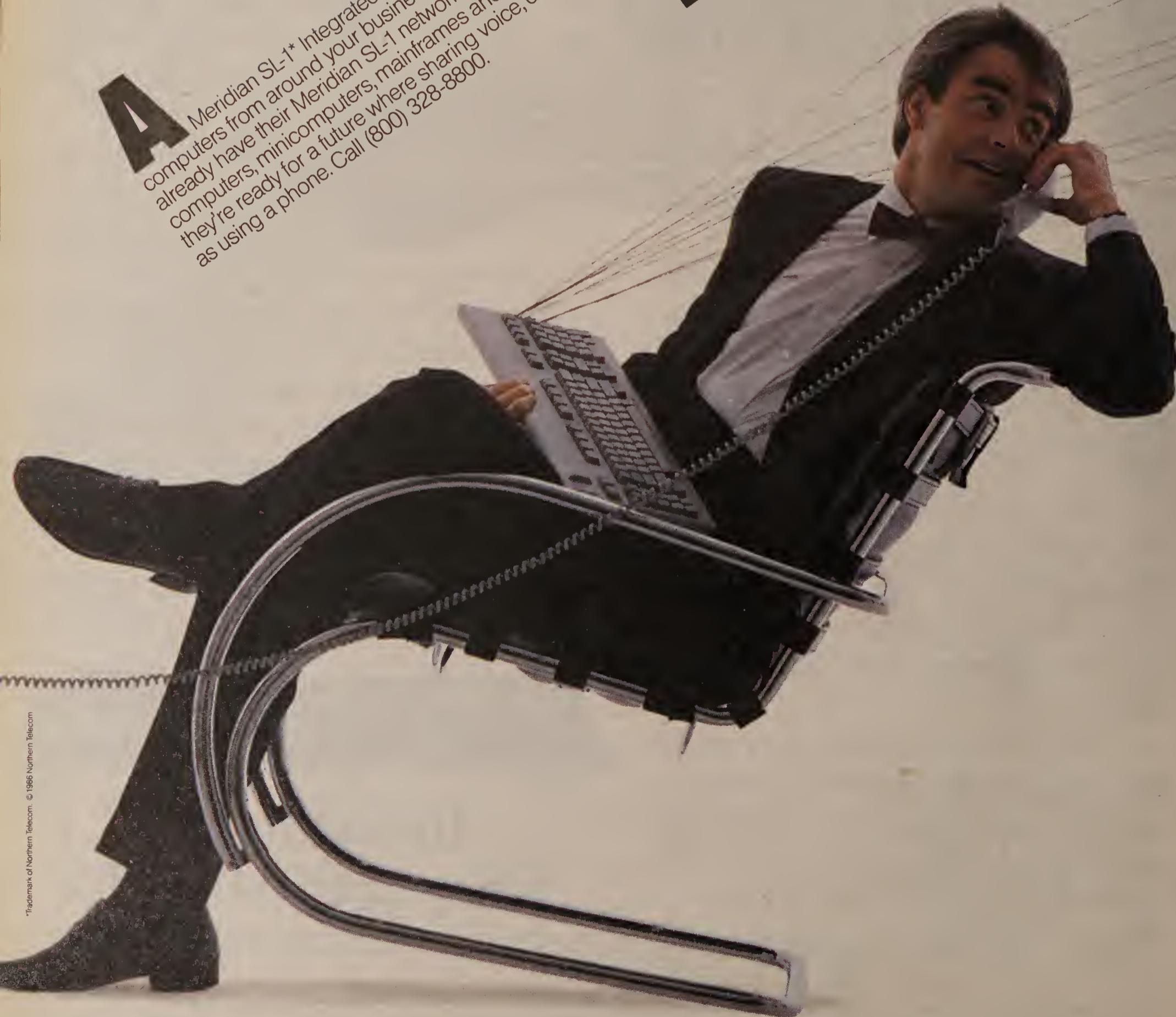
Can you think of a smarter way to open your Windows and save \$3000?

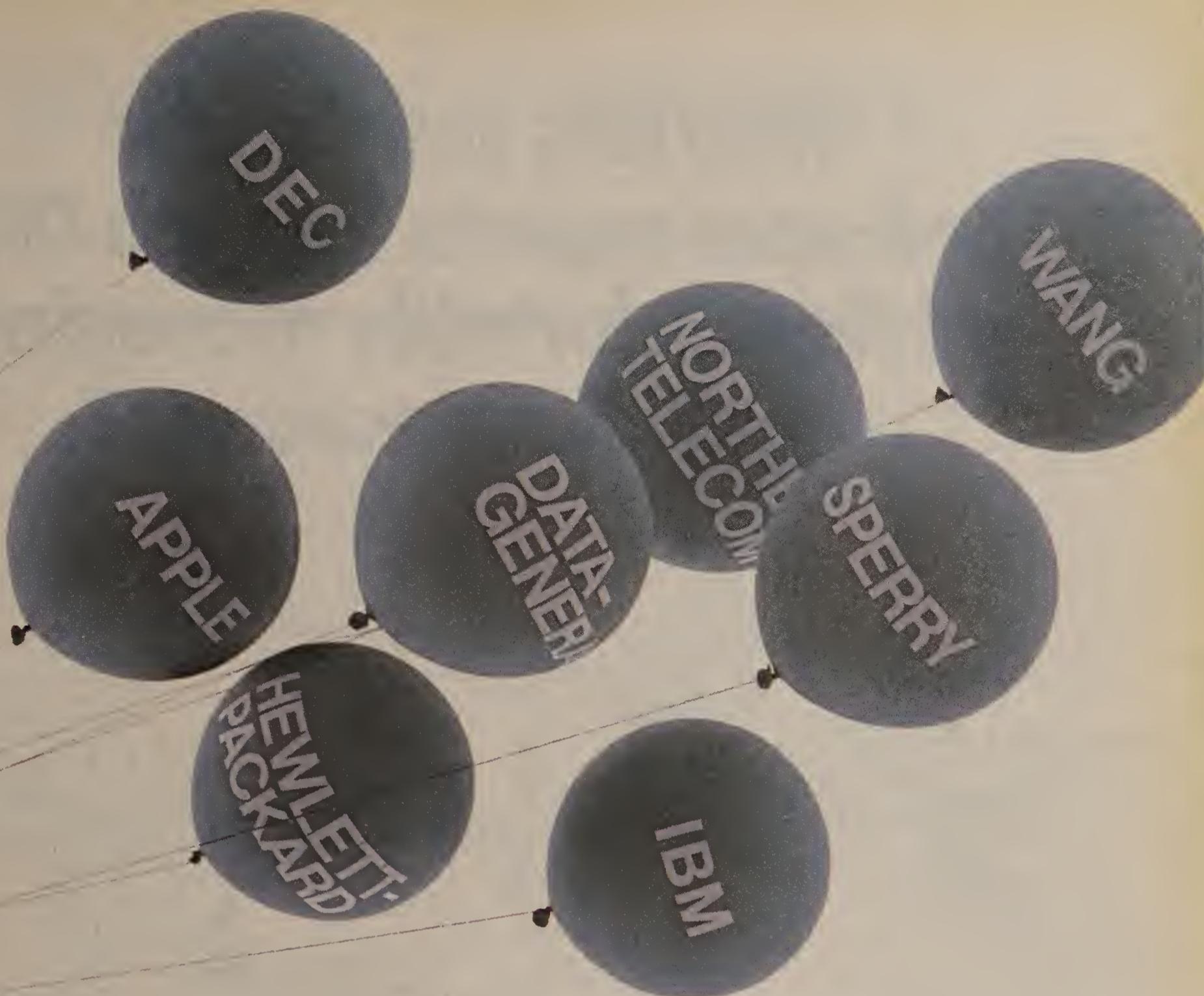


Introducing Microsoft® Mach 10

Microsoft is a registered trademark and InPort is a trademark of Microsoft Corporation.
IBM is a registered trademark of International Business Machines Corporation.

A Meridian SL-1^{*} Integrated Services Network is more than a PBX. It gathers computers from around your business into one cost-efficient resource. Many businesses already have their Meridian SL-1 networking a wide variety of terminals, personal computers, minicomputers, mainframes and, of course, their phone systems. And they're ready for a future where sharing voice, data, text and image will be as simple as using a phone. Call (800) 328-8800.

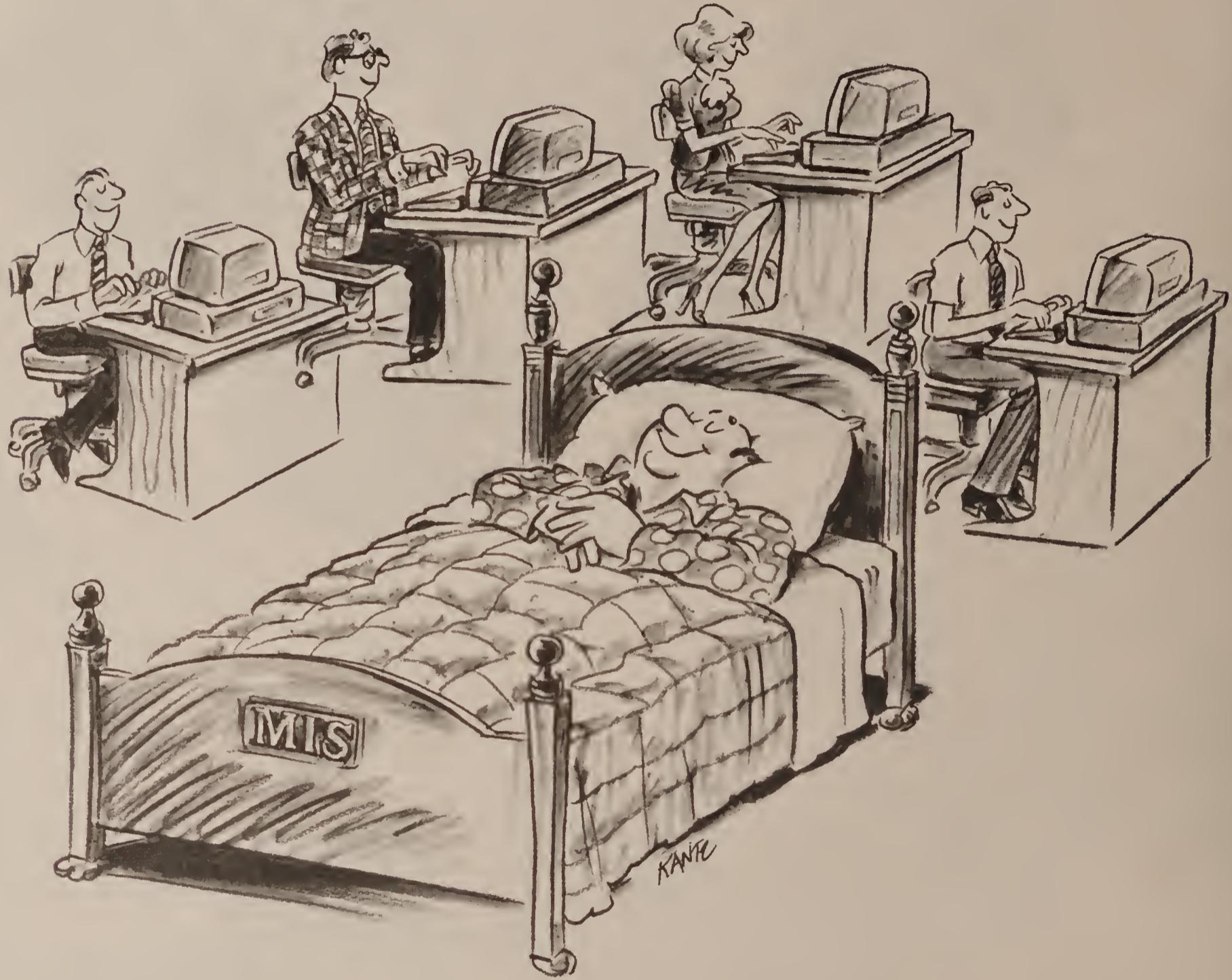




meridian SL-1

NETWORKING

Who lets you deliver end-user reports through CICS while comfortably managing production resources?



Computer Corporation of America.

CCA's Imagine is the only end-user query and reporting system that also lets MIS directors comfortably manage their production resources. Users get the access they need to the corporate database. But you rest easy knowing that the resources you need for production will always be there.

Because each user accesses only the data and reports you authorize. And queries and reports are generated only at the times you specify.

Imagine's all-English, forms-driven format adapts to your existing file structures. A powerful, logical view capability allows end users to relate information from a variety of files. Even files with different structures. And your users don't have to become programmers to do it.

Reports are always specified interactively. But they can be generated either on-line or in batch. And Imagine provides automatic batch job submission. Output management. Periodic report scheduling. And a powerful library system.

With Imagine, you can provide a responsive end-user reporting system and control your on-line environment. What a

comfortable feeling for an MIS director.

For complete information on Imagine, another rich productivity tool from CCA, just send the coupon. Or call John Donnelly at 1-800-258-4100.

Please send me the complete story on Imagine.
Mail to: Four Cambridge Center, Cambridge, MA 02142.

Name _____

Company _____

Title _____ Telephone _____

Address _____

City _____ State _____ Zip _____

Computer Corporation of America

 A Crowntek Company

SOFTWARE & SERVICES



SOFTLINE
Jim Highsmith

Soft harmony depends on trio

At a recent software engineering technology conference, Tom DeMarco (of structured-analysis fame) was asked what we have learned in the past 10 years about developing software. His response was that, even after a decade, what we have learned has not helped much because most people are asleep anyway. New technology is more or less irrelevant, DeMarco concluded. What we require is a new sociology.

From Jerry Weinberg at the same conference: "We already know far more than enough to double productivity — except how to look at ourselves, and we'll do anything to avoid that."

It is instructive that DeMarco, credited with popularizing a new analysis method and tool (data flow diagrams) and Weinberg, a respected author and consultant in systems development, are more concerned with the people problems of increasing productivity than with the technology.

In the last five years, powerful new software development technologies have reached the market. The potential improvements are far too great for any competitive organization to ignore. But how do we reach that potential?

This article addresses three factors critical to improving software development productivity — people, methods and tools — and makes the following recommendations:

- Concentrate on people issues and the installation of adequate organization.

See **SOFT** page 34

Highsmith is a principal of Information Architects, an Atlanta-based consulting company.

From genesis, expert system shells subject to evolution

By Charles Babcock

PHILADELPHIA — When a group of Stanford University researchers in the early 1970s removed the medical knowledge from the expert diagnostic system Mycin, they renamed it Emycin, or empty Mycin, as a joke.

What remained, however, was the inference engine with a skeleton knowledge base, and what they had created was one of the first expert system shells. Since then, Emycin, with the addition of new rules and information, has propagated three more machines: Puff, an expert system for diagnosing respiratory diseases; Dart, an expert system for locating failures in telecommunications systems; and Guidon, an expert system for teaching medical students, according to Frederick Hayes-Roth, chief scientist and vice-president of research and advanced development at Teknowledge, Inc., an expert system shell builder in Palo Alto, Calif.

With an expert system shell, software developers have the equivalent of a

fourth-generation language or application generator for use in the field of artificial intelligence, Hayes-Roth says. But, he warns, developing expert systems remains more an art than a science.

Hayes-Roth helped to develop the M.1 microcomputer and S.1 minicomputer expert system shells at Teknowledge. He served as an opening day speaker at a tutorial session on expert systems at the American Association for Artificial Intelligence conference last week.

System shells are created by generalizing the basic skeleton of an existing expert system into something that can be used for a variety of applications, he explained.

Shells are good for one problem-solving process. Emycin, for example, was a forward-chaining process in which if-then rules acting on additional information helped move the system closer to identifying the disease. Other shells are backward-chaining devices. These types of shells break a problem down into its constituent

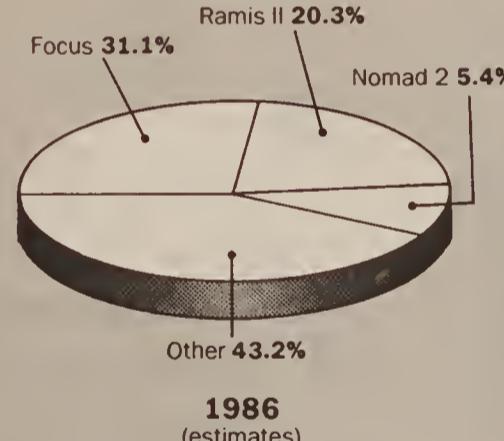
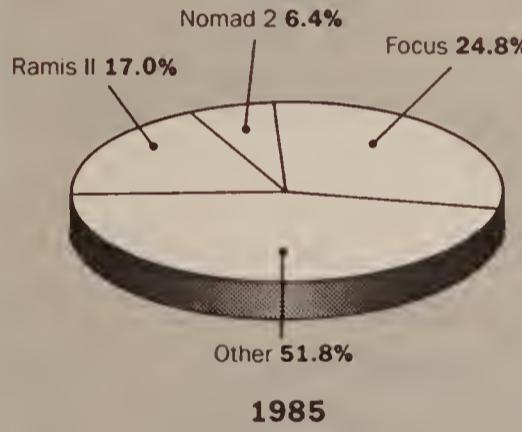
See **EXPERT** page 35

DATA VIEW

JEFF BABINEAU

Use of fourth-generation languages

Focus and Ramis II dominate 4GLs at 141 IBM mainframe and compatible sites



Information provided by International Data Corp.'s "Software Watch"

INSIDE

Pick standards group drafts magnetic media standard/35

NEW THIS WEEK

- Autodesk upgrades Autocad
- Cosmic offers computer-aided design program
- For more on these and other new products, see pp. 75-85.

INSTANT ANALYSIS

"We are impressed with MSA's second-quarter results [revenue of \$47.6 million, up 25%] and are encouraged by the stability of U.S. demand throughout the first half of 1986 and by the enormous strength of international revenues."

— Prudential-Bache Securities July 24 research report on Management Science America, Inc.

ELECTRONIC MAIL COMMUNICATION CENTER

Emc² the Electronic Mail Communication Center system, is the ONLY electronic mail system that links all operating environments: MVS, VSE, VM, CMS, TSO, CICS, IMS, ACF, DISOSS...

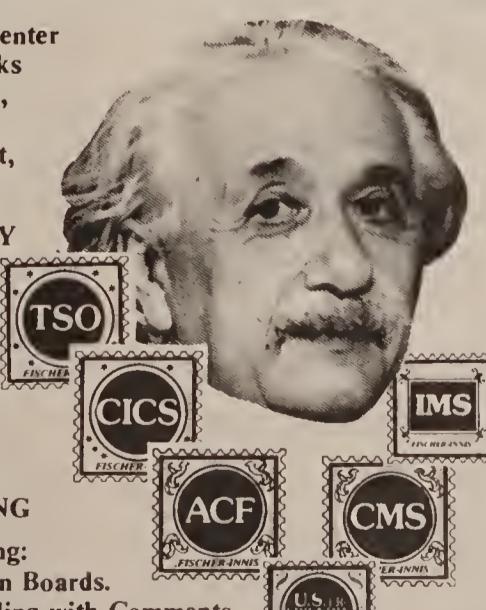
Emc² is the fastest growing mainframe mail product, already with over 250 users worldwide.

Emc² IMPROVES PERSONAL PRODUCTIVITY

- **Emc²** ends "telephone tag" forever with instant communication — across the hall or across the country.
- Calendar features like the Automatic Meeting Scheduler, Timely Reminders "tickler file", and the Things To Do List allow more effective planning and time management.

Emc² ENCOURAGES INFORMATION SHARING

- Gives users a full range of mail features including:
 - Electronic Network Conferencing and Bulletin Boards.
 - Message Answer-Back and Message Forwarding with Comments.
 - Re-transferable Electronic Forms (information may be gathered from many users on one form!).
 - The Hot-News feature broadcasts messages to all users in an attention-getting format.
 - Dozens of other electronic mail features.



- Integrated PC support lets PC users send mail and text to any PC or mainframe user. Special binary file transfer option permits sending binary PC files (like spreadsheets) through **Emc²** to other PC users.
- **Emc²** Links DISOSS with all other IBM environments.
- Provides electronic mail networking between mainframe sites.

Emc² IS EFFICIENT

- **Emc²**'s super-efficient ACF/VTAM Application for TSO, CICS, and CMS installations allows thousands of **Emc²** users in your company, without the overhead of TSO, CICS, or CMS user IDs.

Emc² IS PROVEN EASY TO USE

- Everyone can use **Emc²** right away, without having to open a single manual.
- Text entry is uncomplicated.
- **Emc²** is designed to get the mail moving fast.

Learn about the many other ways **Emc²** can benefit your organization.

 **FISCHER INNIS**
SYSTEMS CORPORATION

CALL US TODAY TOLL-FREE:

800 237-4510

In Florida, call 813 643-1500

SOFTWARE & SERVICES

Soft harmony relies on trio

From page 33

tional change mechanisms.

- Focus on design methodologies.

- Leverage productivity by concentrating on analysis and design support tools.

First, the fact that programming productivity is not a technological problem must be accepted. In some companies, every methodology, project management system, software tool and gadget ever produced has been purchased at some point in the last 10 years — with little positive result.

But in one of the most productive development groups at a \$4 billion company, there are long lists of all the "tools" they do not have — including a data base management system. Their average time to deliver major systems is six to eight months. Programmers produce three to five fully tested CICS programs per day.

What makes the difference? There are many answers to the question: long-term, forward-thinking management; commitment to full hardware and software support for all phases of development; and a 10-year investment in good, design-oriented development methodologies.

Introduction mechanism

The key element missing in many other companies seems to be a successful mechanism for introducing new products into the development environment.

Part of the problem has been the failure to differentiate between design and project management. While project management deals with tasks, scheduling, reporting and quality assurance, design deals with the how-to issues of analysis, data base design and structured programming.

Systems development organizations must begin to recognize the need for better techniques for tasks such as requirements definition, data base design, systems architecture design and programming. If the names Codd, Jackson, Orr, DeMarco, Yourdan, Gane, Constantine and Warnier, to name a few, are not being discussed in your organization, maybe it is time to refocus on design methodologies that help the staff learn to do the task more effectively.

Tools are the third leg of the productivity triangle. There are two types: logical tools, such as data flow diagrams or entity diagrams, help the communications process (graphics, structure diagrams and decision tables), and physical tools, such as Designaid from Nas-

tec Corp. (hardware/software), enable easy construction and modification of those communications mediums.

Newer software tools can even assist algorithmic processes, that is, automate the methods in addition to the documentation.

With a growing number of tools available, where should the emphasis be placed? T. Capers Jones, a respected author and lecturer on programming productivity, has

gathered statistics showing program coding is only about 10% of the cost of large projects, whereas defect removal, at over 40%, is the largest expense.

Other authors have stated the cost difference between discovering a defect in programming and analysis is \$100 to \$1. Yet most efforts over the last 10 years have been directed toward programming tools. Given this data, it appears the emphasis should increasingly be on

tools to support the front end of the development life cycle (requirements and design).

New tools to support analysis and design are beginning to emerge. The potential for computer-aided software engineering (CASE) workstations is enormous. These tools are just beginning to make an impact in leading-edge companies.

Reaching higher levels of software development productivity is not easy. Just as

we cannot expect a nonengineer to design an automobile — even with a sophisticated computer-aided design and manufacturing system — we cannot expect analysts and programmers to use CASE technology without adequate software engineering knowledge.

Only by bringing an integrated, well-disciplined approach to people, methods and tools will the full software development productivity potential be reached.

IBM Software

DB2: The smart way to get your data...

IBM's Database 2 (DB2) is a data base management system you can relate to. Fast enough to handle most production applications. Yet friendly enough to give users easy access to data.

In short, it's a smart way to manage business growth and change.

A Programmer's Delight

Because it's a relational system, DB2 is as simple to use as it is powerful.

Professional programmers can easily write production applications for DB2 environments.

With Structured Query Language (SQL)—a powerful and easy-to-use language—programmers can become

more productive because they can concentrate on what they want to process, rather than on how to get the data. For example, one line of SQL can do the work of many lines of COBOL.

And programmers can also be more efficient because of all the supporting software IBM has developed: high level programming languages, program generators and extensive programming tools and aids.

A User's Dream

What's more, SQL is based on English, which means that users can easily access information in DB2 files, either directly or by means of products like Query Management

SOFTWARE & SERVICES

Expert system shells evolve

From page 34

parts and solve them separately.

In addition, Hayes-Roth said, shells use "hill climbing," a technique in which the distance to a goal is estimated to order the choices in a search of the most promising possibilities.

These are considered "weak methods" in constructing expert systems, meaning they are not specific to the task in the way that separately engineered hardware and software might be.

Knowledge engineers, or people who try to capture the insight of a human expert in a computer system, have recognized a number of problems with an expert system like Emycin.

The systems are not integrated into the environment

for which they were designed. They have a static view of time, which makes it difficult for them to deal with problems that unfold during a long period, and they have a lot of built-in assumptions that do not apply when used on a new class of problems, Hayes-Roth said.

However, researchers at Stanford, in working with Emycin, have come up with Oncocin, a cancer-therapy prescribing system.

According to Hayes-Roth,

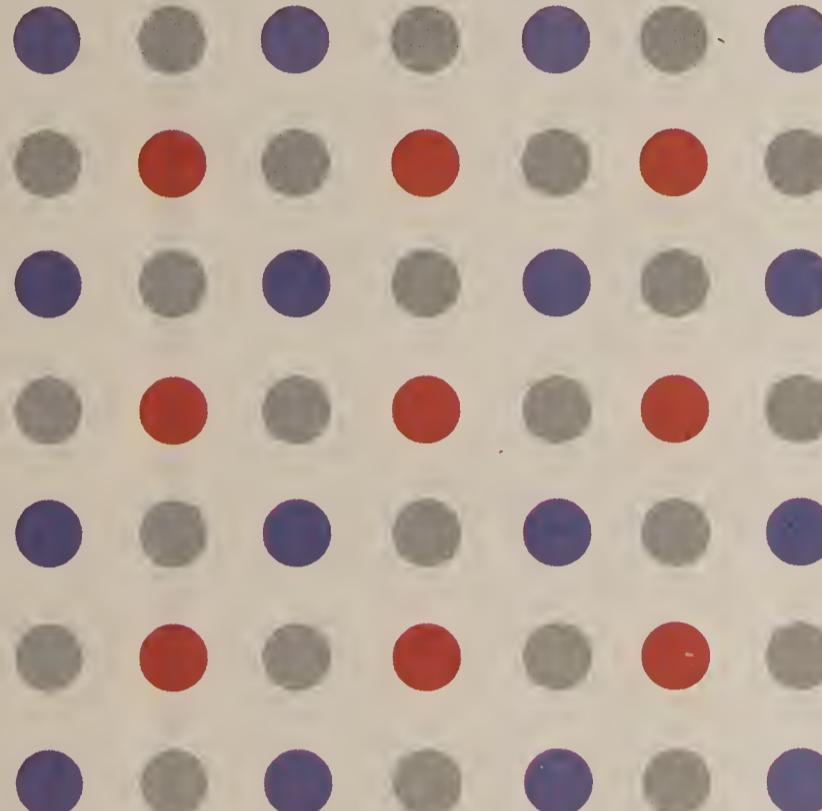
it is closely integrated with the record-keeping in which doctors typically engage, it offers output in the form of graphs, it can back up and explore previous treatments that may be affecting the patient and it can suggest a current therapy for treatment.

Another shell that is not confined to the research laboratories is Salt, a hill-climbing shell from Carnegie-Mellon University that has been used to produce an expert system to configure eleva-

tors, schedule their construction and tell a repairman how to fix them after they are installed in a building, Hayes-Roth said.

"Salt is able to presuppose constraints. It knows problems are interrelated and cannot be checked in isolation," he noted.

The rapid development of expert systems, according to Hayes-Roth, will result in "more effective shells evolving over time, tailored to more specific applications."



...into shape.

Facility (QMF). So users can satisfy their own information needs without adding to the application development backlog. To assist users at every level, DB2 offers extensive online help screens.

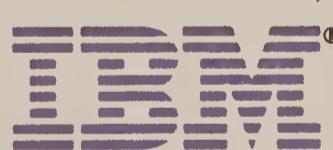
Relational Relations

DB2 data is available to TSO, IMS and CICS users. DB2 was designed to take advantage of IBM's MVS and MVS/XA operating systems, and the multiprocessor architecture and large real storage on IBM systems.

This adds up to a lot of productivity for a lot of people.

Of course, DB2 comes with our excellent service, in-depth support and extensive educational offerings.

The next step is up to you. We can recommend any one of three smart ways to get more information on DB2. Contact your IBM marketing representative. Call 1 800 IBM-2468, Ext. CC/90, for literature. Or use the coupon below.



IBM
DRM, Dept. CC/90
101 Paragon Drive
Montvale, NJ 07645

Please send me information on IBM's DB2 software.
 Please have an IBM marketing representative call me.

Name _____ Title _____

Company _____

Address _____

City _____ State _____ Zip _____

Phone _____

Pick group sets norm

SAN DIEGO — The Spectrum Manufacturers Association (SMA), a collection of 17 vendors that use the Pick operating system from Pick Systems, has recently released drafts of standards for magnetic media interchange and the Basic language.

Last fall, the association designated an SMA standard for data base management systems running on member hardware. SMA's goal is to provide technical standards that will maintain base-level compatibility among products as they are developed.

The association is composed of domestic and foreign companies, two of which are Prime Computer, Inc. and Pick Systems.



DEC HOTLINE
1-800-221-6318

VAX
MII, 730, 750, 780, 785

PDP II
11/23, 73 11/34, 44, 84

PERIPHERALS
Fixed & Removable Drives, Tape Drives, Communications

TERMINALS
VT220, VT100, LA120, LA210, LA50

UNBEATABLE PRICING

INSTANT QUOTES

IMMEDIATE DELIVERY

NATIONAL SERVICE

DATAWARE
Your One-Stop DEC Source

1-800-221-6318

DATAWARE

DATAWARE

DATAWARE

DATAWARE

DATAWARE

DATAWARE

DATAWARE

DATAWARE

30 Bay St., Staten Island, N.Y. 10301
(718) 447-4911

DEC, VAX, PDP11 are registered trademarks of Digital Equipment Corp.

WHAT'S REALLY GOING TO HAPPEN WITH EXPERT SYSTEMS?

EXCITEMENT OVER AN IDEA.

There is great excitement over expert systems. Great excitement over how they can help major corporations and government achieve their strategic goals.

But with the excitement over expert systems comes confusion.

Until recently, prevailing wisdom has been that expert systems demand specialized hardware, a software environment requiring unconventional languages, and a new type of developer using totally different system development and project management approaches. No wonder knowledge engineering hasn't been swept into broad acceptance by the mainstream computing establishment — it *appeared* there was no way to leverage existing assets. Until now.

Until now, no one has been able to convincingly answer the one question: What's really going to happen with expert systems? Teknowledge's commitment and success in the commercial market has enabled us to answer that question.

1

The bulk of all expert systems will be built by today's software engineers and programmers, using expert systems development software written in conventional computing languages, and using an evolution of existing project management methodology.

2

Most expert systems will be implemented on existing conventional hardware and meet conventional software performance standards.

3

Most expert systems will be tightly integrated with existing DBMS, accounting systems and other applications software.

4

Most expert systems will leverage existing software applications and will more effectively solve problems already being solved today.

WHY BELIEVE THE TEKNOWLEDGE ANSWER?

Discovering the answer didn't come easily.

Nearly 200 different companies use Teknowledge's software development products to build their own expert systems. In its custom work, Teknowledge leads the field in applications developed and real problems solved — for its strategic investors, such as General Motors and Procter & Gamble, and many other major corporations.

Teknowledge was granted the first expert systems software patent ever. Teknowledge was awarded the largest

Department of Defense research contract ever granted to a commercial company for expert systems development software — to create *ABE™*, a next-generation of high-performance, knowledge engineering development software.

YOU CAN QUICK START FOR \$7500. CALL TEKNOWLEDGE TODAY.

Where do you go from here? How do you get up to speed fast, and reap the greatest initial payoff with

TEKNOWLEDGE

Applied Artificial Intelligence

1850 Embarcadero Rd., Palo Alto, CA 94303

Copyright ©1986 by Teknowledge. Quick Start and ABE are trademarks of and Teknowledge is a registered trademark of Teknowledge, Inc. IBM is a registered trademark of International Business Machines, Inc.

the least possible cost?

Teknowledge's *Quick Start™* package is the right place to begin building an expert systems capability. It may come as a surprise, but some of the largest potential gains from expert systems can come quickly from simple applications, as well as from the very large advanced projects normally associated with this technology.

So, to keep your entry cost to a minimum, Teknowledge is offering the *Quick Start* package for \$7500. This includes M.1, our PC-based expert systems development software written in C, a multiple delivery system license, one week of knowledge engineering methodology training, and one week of specific M.1 training. In addition, *Quick Start* licensees will receive a reduced price on future licenses to deliver M.1 expert systems on IBM mainframes.

Quick Start is the entry point, from which you can succeed in expert systems on any scale.

So, for your *Quick Start*, or to find out when a Teknowledge seminar will be in your area, call 415/424-9955 now. Or write today.

TRBA Adv.

SYSTEMS & PERIPHERALS



HARD TALK

Donna Raimondi

Drumming up summer news

These are the dog days of summer — that sunny, steamy time of year when even busy MIS managers want to slip on their designer shades and put their moccasin-clad feet up on a porch railing — preferably located on an island somewhere.

While that urge to escape is hitting the work force, vendors seem immune to it. For the past few weeks, strange messages and phone calls from vendors have streamed into *Computerworld's* editorial offices. All of a sudden, vendors have decided to get chatty about their companies' progress since last we met. No new products right now, these messages say, but here is what we've been up to for the last year.

It is sort of a hot-weather public relations version of Aunt Millie's Christmas card missive, in which she relates that cousin Herman broke his toe in February and Aunt Philippina finally divorced nasty Uncle Henry last spring.

Amdahl Corp., for instance, called a press conference, in part to say it has discovered that its 5890 Model 300 dual processor, announced last October, actually outperforms the company's previous measurements. Instead of being 1.7 to 1.9 times more powerful than Amdahl's 5870 dual processor, the Model 300 reportedly is actually 1.8 to 2.1 times more powerful than the 5870.

Also, a note from Alliant Computer Systems Corp. President Ron Gruner says that the minisupercomputer vendor has had three successive quarters of profitability in what has been a tepid

See DRUMMING page 38

Raimondi is a Computerworld senior writer.

Southland tests Amdahl

Early user reports 5890 matches vendor's claims

By Jeffry Beeler

SUNNYVALE, Calif. — The world's largest convenience store chain recently became the first corporation to identify itself publicly as an early user of Amdahl Corp.'s newly available IBM 3090 class of mainframes.

Word that Dallas-based Southland Corp., with an annual revenue of \$12.8 billion, ranks among the first six buyers of Amdahl's 5890 Model 300 coincided with the hardware vendor's claim that the processor exceeds its initial performance estimates by about 10%.

In doing its own testing during the past two months, Southland found that, at least in a batch environment, the 5890 Model 300 performed as well as Amdahl claims. Southland plans to move on-line applica-

tions to the Model 300 next month.

Disclosure of the early user installations and of the greater-than-expected Model 300 throughput came at Amdahl headquarters in Sunnyvale during a recent press conference that featured prepared remarks by Southland's MIS Vice-President David Karney.

Southland, which owns the 7,800-store 7-Eleven and 450-outlet Chief Auto Parts chains, installed its 5890 Model 300 on June 28 to create an upgrade path for its existing Amdahl 5860, which was fast reaching capacity level. The acquisition also promises to enable the firm to maximize the speed of the 1.2 million on-line IBM CICS transactions it processes each day, Karney said.

Prior to installing its latest mainframe, Southland ran its real-time CICS applications on an IBM 3090 Model 200 and divided its batch jobs between the 3090 and the 5860, which competes with IBM's older

See SOUTHLAND page 38

INSIDE

Wang Laboratories introduces a color graphics terminal for use with its VS series of superminicomputers/38

Telex releases its first internally developed terminal system for the airline industry/40

NEW THIS WEEK

- Genicom unveils 3410 Quiet printer
- Displex offers uninterruptible power supply
- For more on these and other new products, see pp. 75-85.

INSTANT ANALYSIS

"IBM says you can't have one architecture up and down the product line. DEC is doing its best to prove that assumption is wrong."

— John McCarthy, research manager at Forrester Research, Inc. in Cambridge, Mass.

CDC says Map V array processor boosts Cyber/180 performance

By James Connolly

MINNEAPOLIS — Mainframe manufacturer Control Data Corp. has introduced an attached 32-bit array processor designed to increase the performance of its Cyber/180 line of superminicomputers and mainframes in computation-intensive applications such as simulation and seismic image and signal processing.

According to the vendor, the Map V performs up to 100 million floating-point operations per second with I/O transfer rates of up to 100M byte/sec. The processor, which attaches to the Cyber/180 mid-range Models 840A, 850A, 860A and 870A and the high-end 990E and 995E, was designed to let customers achieve near-supercomputer performance at a fraction of the cost of a supercomputer, according to Martin Ferrante, CDC marketing manager for array and parallel processing systems.

Ferrante said the Map V can be used to accelerate a variety of simulation and sig-

nal and image processing applications for seismic processing in petroleum exploration, medical imaging, speech analysis, radar and sonar analysis, aircraft simulations, filtering, molecular modeling, matrix manipulations and fast-Fourier transforms.

The I/O interface can reportedly transport data and applications at up to 100M byte/sec., compared with the 1M to 3M byte/sec. rates for competitive systems, according to CDC officials. The vendor claims the increased speed will eliminate the I/O bottleneck that in the past has limited the effectiveness of array processors.

The Map V combines parallel, pipelined multiple processors in an architecture supporting multiple application processing and supports multiple host connections in a mixed-vendor environment, according to a CDC spokesman.

The company said it is offering a 32-bit

See MAP page 40

Floating Point strives to bring supercomputing into office

Announces minisupers, entry-level processor

By James Connolly

BEAVERTON, Ore. — Floating Point Systems, Inc. last week announced two minisupercomputers that it says will move supercomputing capabilities from the computer room into an office environment.

In addition to introducing what it termed independent or stand-alone minisupercomputers named Superserver and Superstation, Floating Point also announced an entry-level version of its attached scientific processor and renamed its other attached processors.

Although intended for use at the

departmental level, the Superstation, Superserver and entry-level M64/10 remain targeted at the engineering and scientific markets.

Floating Point's existing scientific computers, previously known as the FPS-364, FPS-264 and FPS-264/20, were renamed the M64/40, M64/50 and M64/60, respectively.

Company officials said the MAX series application accelerators have been renamed the M64/140 and M64/145. In addition, the company said the Superserver and Superstation will be available as attached processors under the names M64/20 and M64/30, respectively.

The Superstation is available in two configurations, each of which includes a Digital Equipment Corp. Vaxstation II/GPX and from 8M to

32M bytes of memory.

The basic configuration is the M64/320 Superstation, which Floating Point officials said can perform 6 million floating-point operations per second (MFLOPS). It costs \$187,000.

Uses surface-mount boards

The high-end Superstation, the M64/330, reportedly performs 12 MFLOPS and costs \$275,000. The Superstation uses surface-mount boards and, like the other products announced last week, runs Floating Point's SJE operating system. The M64/320 can be field upgraded to the M64/330.

"Our M64 series users have access to one of the most comprehensive libraries of supercomputing math routines and third-party applications

software in the industry.... With the Superstation and Superserver, we are extending supercomputing capability from the computer room environment into the office," said John M. Harte, Floating Point's vice-president for marketing.

He added, "These new independent engines and the new entry-level M64/10 will provide the competitive edge necessary to increase our market share and create the awareness that supercomputing is now reality at the departmental level."

The M64/220 Superserver and the M64/230 Superserver are network computer servers that include Sun Microsystems, Inc. Sun 3/50 workstations. They feature an Ethernet interface with the Transmission Con-

See FLOATING page 40

SYSTEMS & PERIPHERALS

Drumming up summer news

From page 37

period at best for many other computer companies. The note also relates that marketing and sales efforts have been aggressively expanded both at home and internationally (more than 15 new sales offices); that more than 20 application packages are now available on the FX/1 and FX/8 computers; and that it has now installed 32 customer systems.

Wang Laboratories, Inc. decided to send along a package of all the press releases it has cut from newspapers and magazines over a three-month period. News from Stouffville, Ontario's *Stouffville Sun* of a triathlon winner in a Wang-sponsored race competes with *The Vancouver Province*'s report of a Wang-sponsored \$21 million computer research and development start-up in Victoria, B.C.

Digital Equipment Corp. founder and President Ken Olsen decided to wait for the summer doldrums to announce that businesses have to completely rethink the way they operate. He expounded on a concept in which all company departments will do business in a standardized way. His vision of this new business method sounds very much like the way he claims compatible DEC VAX computer systems work.

From DEC's press relations folks

recently came a message that *Computerworld*'s DEC history chart, showing the evolution of DEC machines, was wrong. The chart was printed in an October 1985 issue.

IBM called in to say it liked the article on its RP3 parallel processing project [CW, July 28] except for one line about the fact that Big Blue does not always use the latest technology in some of its research projects. The irony is that the line in question is a quote from one of IBM's own personnel.

And Mitchell Associates, Inc. President Mitch Modeleski, who, despite Prime Computer, Inc.'s objections, ran a third-party vendor exhibition at the MGM Grand Hotel in Reno, Nev., concurrently with the 1986 National Prime User Group (NPUG), also wrote. He sent copies of several letters that went back and forth among him, NPUG President Patricia Craig and the MGM Grand questioning just who is entitled to show up at the site of NPUG meetings.

In a statement that looked like a bald attempt to control Craig, Modeleski wrote to her, "Let us view Prime's latest threat [to pull out of NPUG if the third-party vendors are allowed to exhibit concurrently] for what it is — a bald attempt to control Patricia Craig. . . ."

These bits and pieces are just some of the many keep-in-touch messages received here this summer. Perhaps *Computerworld* should repay in kind, with tales of exciting summer newsroom activities. We could start with the time rain damped the company picnic.

Wang graphics terminal bows

Advent ups support for VS superminis

By James Connolly

LOWELL, Mass. — Wang Laboratories, Inc. last week announced a color graphics terminal for use with its VS series of superminicomputers.

The Advent terminal reportedly provides improved support for high-resolution graphics in conjunction with traditional Wang information management software, graphics applications, integrated data base and spreadsheet packages, including Wang Office, Wang's VS Graphics Facility and Wang 20/20 TM.

Wang officials also said the terminal supports specialized third-party applications for VS systems, such as

mapping, project management and decision support packages.

The terminal includes a 19-in. color monitor, an electronics control unit with a 16-bit Intel Corp. 8086 microprocessor and a three-button mouse device for graphics cursor management. The monitor was designed to provide 1,280 by 1,024 pixel bit-mapped display with 100 pixel/in. resolution. It can display up to 32 colors simultaneously from a palette of 4,096 colors. The terminal also supports multiple-screen windows that display information in several formats.

The company said graphics output can be printed on Wang's LIS-12 and LIS-24 laser printers and the Wang 5577 matrix printer.

The terminal will be available in October and costs \$13,900.

Southland tests Amdahl 5890

From page 37

3081 Model K mainframe. But by early this year, "We had reached a point in our natural growth where we had begun to exhaust our 5860's capacity," Karney said.

"Our requirements for systems resources are growing 40% to 50% per year, partly because of our high-level language development activities," Karney said, citing the inefficiency of those high-level languages.

To ease its resource constraints, Southland recently decided to replace its 5860 with a faster alternative. At first, the user organization considered procuring a second 3090 Model 200 but eventually rejected the option for price/performance reasons. Amdahl claims that the 5890 Model 300 provides about 30% more internal throughput than comparably priced IBM systems, such as the 3090 Model 200.

Nor did Southland cast its lot with IBM's still-unshipped 3090 Model 400, which the retailer would have been unable to install quickly enough for the retail chain to avoid overloading its 5860, Karney said.

For a while, Southland considered replacing its 5860 with an Amdahl 5880 but ultimately nixed that idea, too. Although the multiprocessor 5880 outperforms the uniprocessor 5860 by a wide margin, the larger machine would have provided only enough additional computing power to tide over the company until next year, Karney said. By then, the firm would have been due for another systems upgrade.

In the end, Southland narrowed its field of mainframe prospects to the Model 300, which is expected to satisfy the user organization's resource needs through the middle of 1988. Acquisition of the new CPU also will postpone by several months the expected degradation of the firm's response times, which currently range from three and five seconds, as the business grows, Karney said.

Although Southland was once an early user of Amdahl's 4705 communications processor, the installation of the Model 300 marks the first time that the company has consented to

become a guinea pig for an untried general-purpose mainframe.

"Participation in Amdahl's early-release program definitely raised concerns for us," Karney said. "I knew the criticism I'd hear if the machine fell short of expectations would be much greater than the praise I'd get for putting us on the leading edge of technology."

But despite the potential risks, Southland proceeded with the 5890 Model 300 installation, partly because it was heartened by the results of Amdahl's own internal use of the machine. Since late May, a 256M-byte Model 300 in the vendor's Corporate Computer Services (CCS) department has performed IBM MVS/XA production jobs without a system failure and has supplanted three existing 5860s, according to CCS director Cindy Johnson.

A second 5890 has also executed simulated production applications in Amdahl's Performance Evaluation Center (Ampec), where the machine was 80% to 90% faster in MVS/XA batch tasks than the company's dual-processor 5870. The observed throughput edge is even greater than the 70% to 80% advantage that the vendor quoted when it announced the product last October, according to Amdahl Chief Operating Officer Joseph Zemke.

In IBM Information Management Systems environments, the 5890 Model 300 outperforms the 5870 by 100% to 110%, compared with a predicted superiority of only 80% to 90%, Zemke added. The performance figures that emerged recently from Ampec jibe well with the numbers that Southland has collected independently, Karney said.

During the past seven weeks or so, the retailer has moved all the batch applications that previously resided on its 5860 over to the 5890 Model 300, which provides three times more power than the older CPU. At the same time, Southland has also equipped the Model 300 with Amdahl's Multiple Domain Feature (MDF), which permits two or more operating systems, either similar or dissimilar, to coexist in the same box.

In September, Southland intends to activate its MDF, which will create inside the MVS/XA-based 5890 a logically discrete region for the maintenance of the company's systems software, he added.

ONCE THERE WAS FILE TRANSFER.

NOW THERE'S NDM.

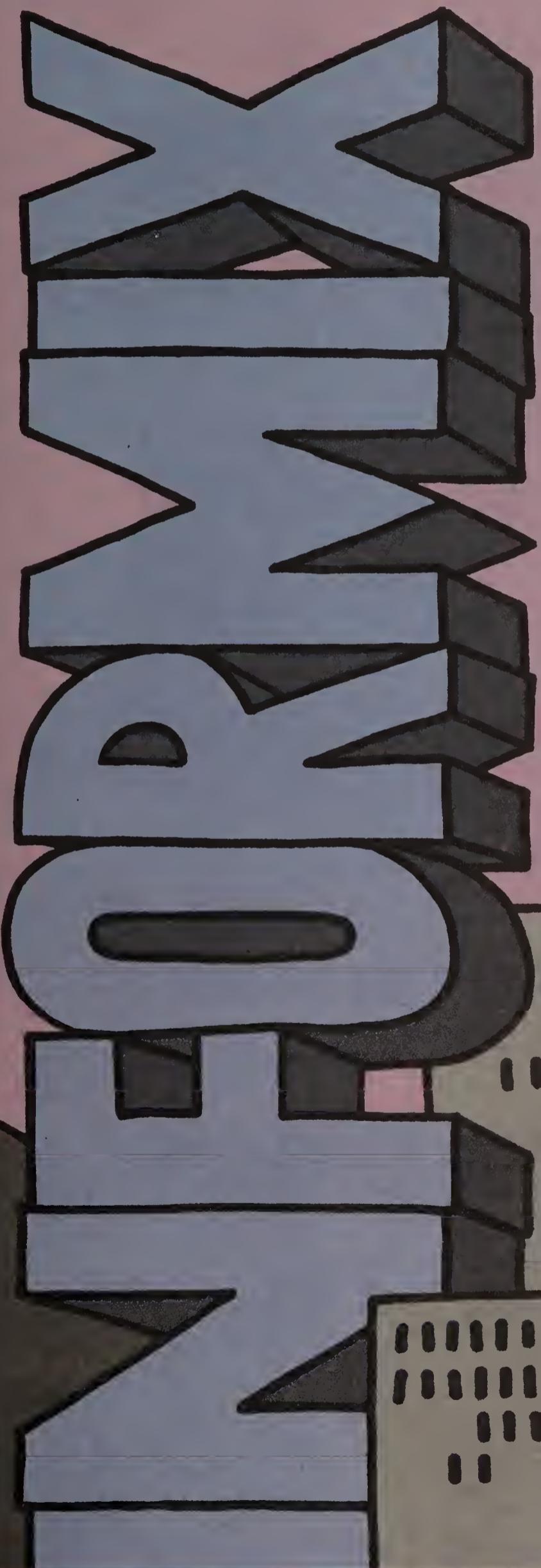
Network DataMover® (NDM) doesn't just move files. It's the most advanced data transfer management system available for the IBM SNA mainframe environment.

NDM makes yesterday's file transfer systems obsolete with powerful data handling capabilities. NDM maintains data security. Automates operations. And continuously monitors data transfer activity.

Once there was file transfer. Now there's a system-wide solution to managing data movement through your network. Now there's NDM.

SYSTEMS CENTER
1320 Greenway Drive
Suite 300
Irving, TX 75038
(800) 292-0104
In Texas, (214) 550-0318

FREE 30 DAY TRIAL! MAKE THE MOVE TO NDM.	
1-800-292-0104 (IN TEXAS, (214) 550-0318)	
NAME	ADDRESS
CITY	STATE
ZIP	<input type="checkbox"/> NDM-MVS <input type="checkbox"/> NDM-PC <input type="checkbox"/> NDM-VSE



INFORMIX®

It's the relational database management system that's a big part of a lot of big companies. Like Citicorp, Sheraton, EDS/General Motors, Hewlett-Packard and Manufacturers Hanover Trust to name only a few.

Which should come as no surprise. After all, INFORMIX is the best-selling RDBMS for UNIX™.* And has been for years.

And now it's making quite a name for itself in MS™-DOS and computer networks. With VMS™ on the way.

For a free brochure, call 415/322-4100. Or write us at 4100 Bohannon Drive, Menlo Park, CA 94025.

INFORMIX. The RDBMS for people who know better.



**RELATIONAL DATABASE
SYSTEMS, INC.**

SYSTEMS & PERIPHERALS

Telex launches terminal system for the airline industry

By James Connolly

TULSA, Okla. — Expanding upon the capabilities of its earlier terminal line, Telex Computer Products, Inc. has announced a series of products developed specifically for the airline industry.

The Airline Systems Automation products reportedly are compatible with the existing Telex 1000 and Telex

4000 terminal systems and are the company's first internally developed terminal offerings for airlines. The products include two IBM 3270-compatible display stations, a control unit and a selection of intelligent workstation configurations.

The display stations are the 078-A and the 080-A terminals, which the company

said are designed to fit in the limited space of an airline ticket counter or reservations office. They include the choice of either green or amber monochrome monitors. The 078-A has a 12-in. display with split-screen capability and costs \$1,700. The 080-A features a 15-in. display with quad-screen partitioning and costs \$2,750.

Both are available with either Airline Link Control or 3270 keyboards.

The 070-A control unit reportedly is compatible with Telex's 1070/1076 controller and was designed to support cluster configurations of up to 32 terminals on a single coaxial cable of up to 5,000 ft under various protocols. It costs \$3,400.

The Intelligent System Series is based on Telex's 1280 Intelligent Workstation, which is compatible with the IBM Personal Computer AT and was designed to connect through an Airline Device Feature (ADF) or Airline Controller Feature (ACF) to airline host systems. The ACF costs \$1,500, and the ADF costs \$1,200.



COMPARED TO MEMO, ALL OTHER ELECTRONIC MAIL SOFTWARE IS FOR THE BIRDS.

There's a whole flock of messaging systems available on the market today. But only one electronic mail software system soars above the competition.

MEMO Electronic Mail Software.*

Quite simply, MEMO is the most advanced, efficient and cost-effective electronic mail software around.

MEMO combines the convenience and advantages of written communication with the speed of a telephone call. No system is easier to use or offers as many functions. With MEMO



you save time, money... and the hassles of interruptions and miscommunication.

So why get pigeonholed into a communications system which doesn't meet your needs?

Try MEMO. For a free 45-day trial, contact Clark Information Technologies at: 1-800-331-MEMO (1-800-331-6366) or 6602 West Clark Drive, South Bend, Indiana 46628.

*MEMO Electronic Mail Software runs under VTAM on OS/MVS and DOS/VSE systems.

MEMO
ELECTRONIC MAIL SOFTWARE

Electronic Mail Software from **CLARK** Information Technologies

"MEMO" is a trademark of Verimation AB
© 1986 Clark Information Technologies Corporation

Floating Point minisupers

From page 37

trol Protocol and Internet Protocol and Sun's Network File System.

The M64/220 provides 6 MFLOPS of peak performance and the M64/230 is rated at 12 MFLOPS, according to the company.

Like the Superstation models, the Superservers are available with 8M bytes to 32M bytes of memory and can be field upgraded from the basic model to the high-end model.

The M64/10 was designed to be a front-end-compatible minisupercomputer delivering 6 MFLOPS of power for less than \$100,000.

The M64/10 is available with 8M bytes of memory, a 170M-byte disk drive and a software package that includes Fortran and SJE as well as Floating Point's Program Development Software without attendant math libraries.

According to a company spokesman, it can be upgraded to other M64 series models as user needs increase.

Floating Point announced its first 64-bit attached minisupercomputers in 1981. Company officials claimed that peak performance ranges in the M64 series now reach 341 MFLOPS at prices ranging to more than \$1 million.

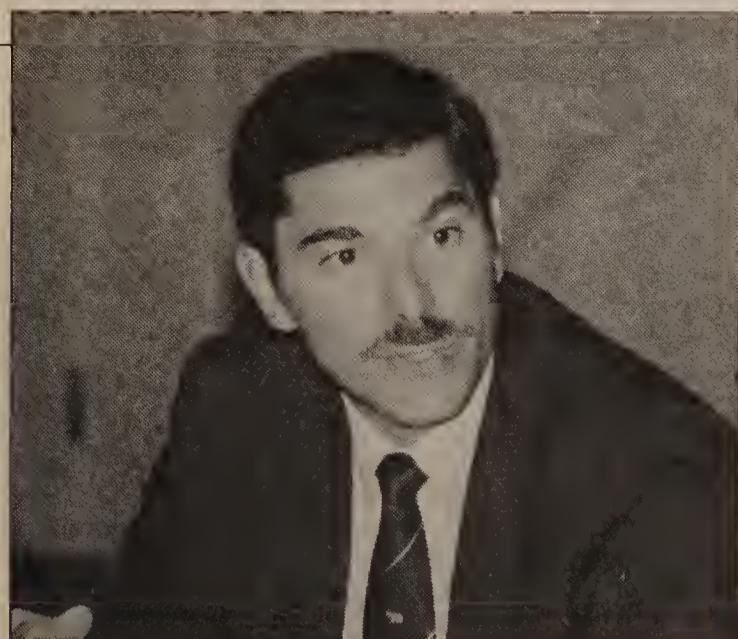
Map V boosts Cyber/180

From page 37

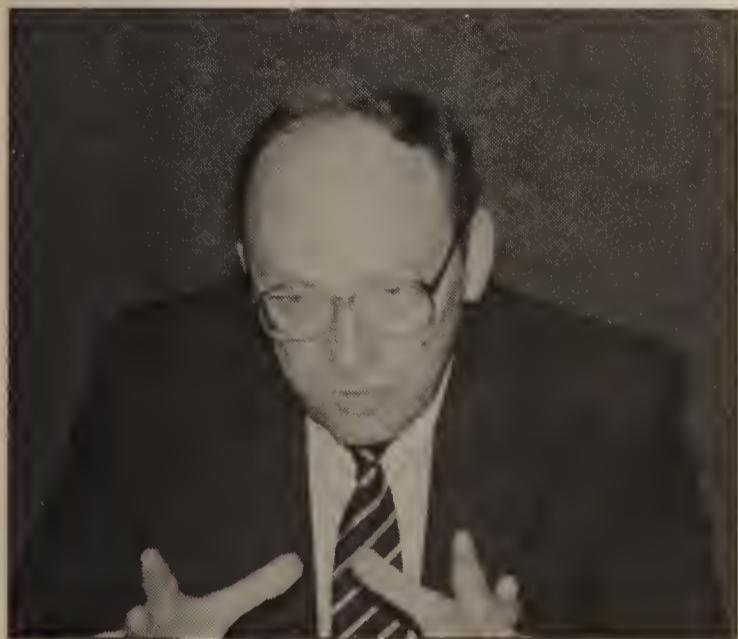
array processor rather than a 64-bit processor because the simulations and processing problems at which the Map V is targeted do not typically require 64-bit processing.

However, CDC said it expects the typical Map V customer to be a large, sophisticated organization that needs a turnkey solution or products that allow for rapid development and processing of proprietary codes.

Executive Roundtable



Beneficial Data Processing's Luciano Corea Jr.



Transamerica Financial Services' Arnold Danberg



Quaker Oats' Ronald Brzezinski



Georgia Power's Grady Baker

End-user computing *MIS answers the call*

The news will come as a shock to few MIS managers: Computing power is increasingly being taken in hand by end users. From all indications, they like what they've got and are eager for more.

Recently, Computerworld invited four MIS executives to discuss end-user computing — its form in and impact on their companies.

In the discussion, moderated by Senior Editor Glenn Risken, it became clear that MIS is willingly taking great steps to provide computer power across the desktops of American workers. But technological and managerial challenges still abound.

How do you define end-user computing in your organization?

Danberg: I would define end-user computing as an environment in which the user has free control and latitude over the process. He may use data which is interchanged through the mainframe or the MIS division, or he may create his own data. But he's in control, he's responsible for the product and the effectiveness of the use of the equipment.

Baker: We define end-user computing as information systems as opposed to foundation systems: The user is totally in control of what's done and what's used. And the MIS function is a support function to the client, and we call them clients.

Corea: We consider end-user computing to be computing that occurs outside the MIS arena. In essence, we provide them support. They are in control of their data, and we've come 180 degrees from the days when DP was driving computer use. They are now giving us the direction — what they need, what they want. And they are, in essence, responsible for their own destiny.

Brzezinski: Our definition has been one where the client — we kind of struck the word "user" from our vocabulary — is responsible for all aspects of computing, except manipulating or changing mainframe data. We can and do provide support to them, but in a sense, they achieve their end results through the access, support and manipulation of data as given to them by the mainframe caretakers.

A couple of years ago, we went through an assessment of all the money being spent at Quaker's information systems activity. We found that MIS was paying a lot of the bills but managing only 40% of that total dollar figure. If you talk about pure management, how it was being used, it was 40% of the total

dollar figure. It was an eye-opener. So end-user computing had been there for a long time but sort of under the covers. Now it's brought out.

Why is the word "user" suddenly taboo?

Brzezinski: It was deemed insulting, and some people made a conscientious effort throughout the entire company to stop using the word, and it's almost gotten to become second nature that you refer to all the people who are outside the MIS area but receiving services as "clients." And that, in a sense, is maybe even a little subordinating, but it's better than the connotation that "user" put on.

End-user concerns in 1986

What are the major concerns of your clients or end users now?

Brzezinski: Data access and integration is overwhelmingly the biggest issue. It started back in the time-sharing days, eight to 10 years ago in our company. Now that the clients have the capability to download data, how do you provide them that easily?

Corea: Our users are concerned about us being responsive to their needs. We can give them the equipment, but they need more than just equipment put on a desk and software installed for them. They're looking for a total support group dedicated to them that they can go to.

Danberg: The roles and responsibilities have been perplexing to us. Where does the client or user's responsibility start and end with relation to the process? We find that the more that end-user computing gets embedded into the process, you've got the same problems you have that stem from the mainframe — the problems of security, fallback and

Executive Roundtable

End users beckon, MIS answers the call

Continued from previous page

recovery, reports and the like.

And yet all of the traditional safeguards that the MIS people have struggled with for 30 years now may or may not be in place. We find that people do some very good and creative work, and then they, for whatever reason, either leave or get transferred, and the process that they've developed leaves with them and isn't easily transportable or maintainable. I'd say that both the user community as well as the MIS division are wrestling with that problem.

Brzezinski: Does the MIS division take on the responsibility to assure that the procedure and business aspect of what they develop is secure?

Danberg: You're addressing the mainframe now?

Brzezinski: No, I'm talking about personal computers.

Danberg: We're beginning to. One of our sister organizations, Transamerica Insurance Group, has done a splendid job. In essence, they have developed a continuum of classes of end-user computing, going from jobs that are management-oriented, either internally or externally, to jobs that are just analytical in nature. Along that continuum there are degrees of control, degrees of auditability in terms of standards.

Data security: Who is responsible?

Brzezinski: I know in our company, the auditors are attempting to have us be policemen for that type of caretaker role. In my opinion, that is really a management issue at the management level outside the information systems department — once the education and awareness of what the dangers are have been expressed. I find it too much of a responsibility to entrust to inside the MIS department.

Danberg: I don't agree. The information officer of the organization, which we happen to be, has a re-

sponsibility to insure the valuable asset of that organization, which is information, and that it's used correctly. Just like the chief financial officer has the responsibility to see that whoever may be performing financial applications within the organization is doing it in a correct and consistent format. That's our responsibility; that's what we've been trained to do; that's what we've got sizable budgets to do. And how we implement it determines our success. But I don't believe we can shun that responsibility.

Brzezinski: No, I'm not saying shun the responsibility. You do it through issuing a procedure and training policy like the financial divisions do. But to take on that policeman role and caretaker role for all of distributed applications is asking way too much of any centralized group.

Who should do it?

Brzezinski: The management of that organization. The same way that you as a manager have to manage your own petty cash and expense account type of responsibilities, you have to extend that to know how you use information. It's a dispute in the industry right now.

Danberg: I wouldn't disagree with what you say, Ron [Brzezinski], except that in the same fashion that auditors, either DP auditors or financial auditors, set up standards and guidelines and rules, it's the MIS responsibility to do the same.

Brzezinski: Agreed.

Danberg: Now, who polices it is a question of how the industry matures over time. Certainly, as people become more computer literate — and incoming management in today's industry is by and large computer literate — that policing role will diminish. At the moment, at least as I see it within our organization, if we don't do it, nobody else will. Hence, it's our responsibility to do it.

Baker: Information resources is a service organization just like the other staff organizations in the company. I have a great deal of trouble giving them that much authority and responsibility over the resources that I need to get my job done.

The security thing is overplayed; we're all public corporations, and we publish Form 10Qs and annual reports, and an enormous amount goes out to the public, so why protect the information from our employees?

We spend a lot of money on security that we don't need to. In my own case, I have a PC in my office that is connected to about four other computers, and each one of them has an elaborate logon process. And all of the code words that I need to get into the employee data base and the customer data base and all the others are written on a 3- by 5-in. card that lays right by my keyboard. Executives do not remember logon sequences very well. And you're just wasting your time to make it difficult to get in there.

”

'Enormously expensive decisions were being made at very low levels in the corporation. The very low-level managers were thinking of very expensive needs that could only be met through expensive data processing projects.'

— Georgia Power's Grady Baker

I agree with Arnie [Danberg] that some guidelines and rules should come from the people who are familiar with how to secure it, but as far as the security is concerned in the user department, it's their resource and they need to take care of it just like with petty cash.

Brzezinski: Grady [Baker], are you MIS or are you in the general management? I'm having a hard time positioning you.

Baker: About 18 months ago, we had a reorganization, and I got responsibility for the information resources. And then a few months ago we had another reorganization, and I got rid of that thing.

Encountering the end user and meeting expectations

What are some of the end-user-related frustrations you encounter?

Baker: One of the biggest frustrations to general management is the cost of information resources as regards the results. We are continually being oversold on what can be accomplished and quite frequently disappointed about what is actually accomplished.

Another thing which frustrates us is the time dimension that particularly mainframe people work with. And general management is used to telling people to do something and have it done by Tuesday. But when you talk to your mainframe processors, they talk to you in quarters, and they say, "We'll do it third-quarter next year," and you know that if they just miss it by one quarter, they've got a nine-month leeway. That's really not what you're used to.

That's the reason, I believe, a lot of managers are migrating toward the smaller processors, because it is possible to do something quickly. Whereas on mainframes, even simple things can be quite complex if they have an impact on executive routines or other programming. And the fact that your mainframe processors are, on the average, two years behind in their programming makes it difficult for you to respond to needs of others quickly.

We've been hearing that for a long time now, and we have to wonder if there ever is going to be some solution to that problem.

Baker: We divided systems into two types: information systems and foundation systems. Anybody who would ever think about running a foundation system on the minis and micros, that's just impossible. You're going to send out four million bills a month or four million reports a month; the mainframe process is the only way to do it. If you're going to keep up with the payroll on 15,000 people, the mainframe process is the only way to do it.

But the information systems — the tools that an executive or clerk or manager needs to do his business — can be very quickly and easily handled on the smaller machines. It has been my experience, and I have access from my office to the large processors, that there's very little data there that I'm interested in, because it's all data, there's very little information.

Corea: It's important that infor-

mation systems give that direction to the end user also. We have a three-tier approach: We've got a mainframe application, we've got minis and then we've got the personal computer.

A lot of times the end user does not know where logically this should fit. So they're trying to put a mainframe application on a PC. If you are running 10 to 12 hours on a PC, then you've misplaced that application. A lot of times, as Grady [Baker] mentioned, they can't wait two years to get it. So what we try to do is say, "We've got three resources here; let us go in and sit down and help you. What do you want to do?"

How do you want to do it?"

First off, make your determination — is it really an end-user application or maybe a foundation system? Or maybe we go in and we prototype it at a smaller scale; so that when it goes into the DP side of the house, there has been a lot of groundwork laid. Reports have been defined; you know what you want to do; and results are what you're looking for.

Maybe you put an interim system up without all the bells and whistles, but it gives the end user something to do and you can afford to take the time to get a full-blown DP foundation system going. That's what we think is valuable, because the end user really is trying but doesn't understand all the tools that are out there.

End-user relations: An evolution

How has your relationship changed with the end users in the last five years? Has it gotten better, worse?

Corea: It's gotten better in our case, because before there was no such thing as end-user computing. We've evolved over three years. What we find is that you can't be all things to all people, and you're always going to have some users who think the sun rises and sets on you. You're going to have others who could care less if you even existed. And that's something you have to accept. You just can't do all things at all times. You have to prioritize your resources and go for the high-payback items when it comes to assistance.

How do you decide which client gets the priority attention?

Corea: What we attempt to do is when they fill out a request for service, we ask them to give us a cost/payback analysis. What are the benefits of us going in and doing this?

If you tell me you can potentially bring a million dollars to the bottom line vs. someone who has a nice thing that will bring \$5,000 or \$10,000, that makes it easy. What's

Executive Roundtable

The roundtable participants

Grady Baker
Georgia Power Co.

Grady Baker is executive vice-president and general manager of Georgia Power Co. in Atlanta. Before being named to his current position in March 1985, Baker was responsible for marketing and administrative services and in that capacity oversaw the MIS function. He is a technology buff who closely watches the trends and transitions within the MIS world.

An electrical engineering graduate of Georgia Institute of Technology, Baker joined Georgia Power in 1953 and has moved steadily up through the corporate ranks ever since.

According to Baker, Georgia Power spends in excess of \$100 million per year on computer-related activities.

The \$9 billion investor-owned utility serves 57,000 of the state's 59,000 square miles.



Ronald Brzezinski
Quaker Oats Co.

Ronald Brzezinski is corporate vice-president of information systems for Quaker Oats Co. in Chicago. In this role, Brzezinski is responsible for all computing and communications technology in the company.

Brzezinski notes that the end-user population at Quaker is represented by 2,500 knowledge workers at all levels of the corporation.

With 25 years in the information services industry, Brzezinski has worked in such varied positions as manager of consulting services for Nolan Norton & Co. as well as a professor of computer technology at Purdue University. He has an MBA from the University of Michigan.

Quaker Oats is an international manufacturer and marketer of foods, pet foods, toys, tools, clothing and crafts.



Luciano Corea Jr.
Beneficial Data Processing Corp.

Luciano Corea Jr. is vice-president of office information systems for Beneficial Data Processing Corp. in Peapack, N.J. Corea's department consists of office systems, information center, electronic publishing and small systems and is dedicated to serving the end-user community with office automation, personal computing and fourth-generation language support.

Corea notes that Beneficial has installed more than 1,200 workstations in its Peapack headquarters alone, with the potential of end-user computing on all of them.

Corea has been a member of the DP staff for 16 years and has been in the DP field for 21 years. He is a graduate of Montclair State College in Upper Montclair, N.J.

Beneficial Data Processing is a subsidiary of Beneficial Corp., a large financial service company.



Arnold Danberg
Transamerica Financial Services

Arnold Danberg, MIS vice-president for Transamerica Financial Services in Los Angeles, has spent nearly 30 years in the data processing industry. In addition to his role as MIS vice-president, Danberg serves as director of electronic data processing for Transamerica Financial Corp., which includes Transamerica Title Insurance and Transamerica Tax Services.

Danberg is responsible for providing support to more than 500 financial professionals at Transamerica. He participated in the development of on-line systems with Teleregister and Bunker Ramo Corp. as well as time-sharing services with Computer Sciences Corp.

Transamerica Financial Services, a subsidiary of Transamerica Corp., has more than 400 consumer loan offices in 26 states.



not always easy is the benefit analysis that the user has to give. So it's a learning curve on their side. We attempt to juggle as much as we can, but when push comes to shove, we take the highest payback item.

That sounds good on paper, but I wonder if there's not a lot of gray area there.

Corea: Definitely.

Baker: Very much so. To control cost and prioritize projects, we have something that we call a management council — made up of senior vice-presidents and executive vice-presidents — which meets once a month. Starting about a year ago, we got the MIS manager to come in and make a 30-minute presentation every month on the cost and on what he's doing. And he outlines for every officer in that room the total that he has been billed for information services over the last month.

It was really an awakening for some of them who knew their DP budgets were big, but they never knew how big they were. So we got a very significant senior management interest in what's going on in the information resources world.

One of the things we found was that enormously expensive decisions were being made at very low levels in the corporation. The very low-level managers were thinking of very expensive needs that could only be met through the expensive data processing projects. We found we were doing a lot of things that somebody way down in the organization just wanted. Senior management was not able to test the need adequately.

We have a generation of senior

managers — and it is a generation problem, it seems to me — who can't type; and they don't want to type, and they'll never learn to type. They're not familiar with data processing. They don't know anything about computers and are not interested in it as a technology. They're just not equipped to manage it.

Coming along behind this generation of senior managers is another generation of senior managers who will be much more computer literate because they've been taught this in high school, and certainly, you can't hire an engineer now without getting a very good computer expert. They're good analysts, they're good programmers and they understand the whole world. But that senior management generation is coming in, and right now, you're dealing with people who, in general, are not that great.

Brzezinski: Getting back to your question, though. Client computing has probably been one of the driving forces that woke up general management to the idea that there's a lot more complexity out there than they thought.

But, by itself, it did nothing but maybe frustrate a lot of people. And if you couple that, as Quaker has, with a refocusing of all information systems resources and programs and education, this played a very important role in helping educate the general population. That seems to be kind of naturally evolving throughout Quaker right now. We have 1,000+ people using personal computing with daily access.

So the role of the PC or client computing has, in the last two years

in particular, significantly increased the awareness of what was going on in MIS; and it just made all the other planning, the committees, the funding — in particular the funding and the funding awareness — easier to sell and communicate.

So I really give a lot of credit to the use of personal or client computing out there in the industry. It's just made our jobs easier, contrary to the way a lot of us looked at it four years ago — as a threat. Hindsight says it's really been a blessing.

Baker: Provided you let your definition of your job move with the times.

Danberg: Grady's [Baker] point about letting your definition of the job move with the times is an astute one, because that's something we need to do as MIS people. There's no doubt in my mind that we're going to find PCs embedding themselves into the process.

Right now, by and large, they're used primarily as analytical tools. But real distributive processing is about to come, if it's not upon us right now. And as PCs get more embedded into the process, the exposure is going to get higher and higher.

And cost-effectiveness comes into play, the question of security becomes an issue, as does the question of accountability — the end user now assumes responsibility for it. And they're going to need support. So the traditional information systems organization we've seen in the past is going to move from a manufacturing mode into more of a maintenance and support mode. That's going to need to be recognized.

What are your opinions of the *Fortune* magazine cover story of a few months ago that said that productivity hasn't really been affected at all by the influx of information systems?

Brzezinski: I disagree. Productivity has increased significantly in many of the areas. Now there are certain areas where it's a status symbol, but we can point to case after case where a lot of our business people are doing things, having much more intelligent access in the use of information.

It has a major impact on productivity in our company, from the vice-presidential level right down to the first level of supervision or clerical.

Can you track that in any formal way?

Brzezinski: We are putting up some benefits-measuring systems to do that. I'm ex-Nolan Norton, and we were big on that. What it amounts to is that if you look at certain sales per employee, we aren't that good yet.

But our mechanisms are coming into place to start tracking it.

Reaping the rewards and measuring the benefits

Have these satisfied users become your best, most enthusiastic backers of computing?

Brzezinski: Let's put it this way, maybe they're not standing up and shouting "Go, go," but what they're doing is encouraging us and not standing in the way, like we'd have seen three years ago. I don't know if anybody wants to be a crusader for

Continued on next page

Executive Roundtable

Continued from previous page

another department, but on the other hand, by joint presentations and joint discussions of what's going on, we've formed an awful lot of partnerships which we never had before.

That's probably the key, that we have a lot more working partnerships throughout the entire organization.

Corea: We participated in that *Fortune* study. They interviewed our chairman, Finn Caspersen, who's a driving force behind the implementation of office systems at Beneficial. He was one of the few who said that productivity has absolutely increased as a result of installing the systems.

Part of the problem with that article was the industry hasn't come far enough. They're still looking at soft-

dollar savings; they're still looking at percentage of gain vs. how much time did I save because I'm a manager or secretary or clerical? That's the wrong target to shoot at.

There's a methodology that's being developed that shows you how to go out and get hard dollars. We were able to go in, in one instance, and create through our network the ability to refine documents on an almost

"

'I give a lot of credit to personal computing in the industry. It's made our jobs easier, contrary to the way a lot of us looked at it four years ago — as a threat. Hindsight says it's really been a blessing.'

— Quaker Oats' Ronald Brzezinski

day-by-day, hour-by-hour basis. We estimated a reduce-to-risk and also reduce-to-revenue of a million dollars in one activity that took place over a two-week time period. The dollars are there.

You [Brzezinski] mentioned the Lotus implication. You take a spreadsheet, and in some instances, people are saving tens of thousands of dollars on a simple spreadsheet. The

evidence is so obvious that it's being overlooked. It's now commonplace, and the real benefit behind it is ignored.

Danberg: It's particularly difficult to measure the benefit. Some of the early claims of office automation were ludicrous. They equated giving a tractor to a farmer and how many acres he could plow vs. how many more letters a secretary could do if she had a word processor. Those are ludicrous comparisons.

Baker: If the farmer doesn't own any more acres, the tractor doesn't mean too much to him.

Danberg: That's right. And if you save a secretary four hours a day, and she has nothing else to do, that's not very much of a savings either. So, we have found in some of our operations that the use of support systems, especially those that do some data base manipulation and word processing, have shown us productivity factors in the area of 40%. We don't know the soft aspect of it — how many errors are not made any longer and things of that sort. The industry has suffered — at least the office automation aspect — from those early claims that were just outside the realm of reasonableness.

Corea: The sad part about it, though, is they're still pushing those same claims for justification. And now, senior management's coming back and saying, "Fine, now prove it." How do you prove a soft saving? And like you said, I'm getting my job done two hours sooner, so I can go play golf. The company hasn't gotten anything out of that.

Baker: There are two ways to improve productivity. One is to automate things that you are doing and the other is to do new things. And the most difficult thing to measure about the impact of information resources of an organization is the value of what you're doing that you couldn't do before, because you have no base to measure it against.

In 1976 we used some of the first 8-bit processors to get a data extract off electric system operating computers, and we made that available in a 300 bit/sec. dial-up to the managers of the electric system. It made us millions of dollars, because the president of the company would get up every morning at five o'clock and he would dial up. And while his printer was going, he put on the coffee. And by the time his coffee was ready, he had two or three pages, and he would sit there and read it.

By the time he got to the office, he was ready to straighten things out. Because he did that, everybody else got interested in it. And the fact that information was available on-line made us millions of dollars and a better operated electric system.

Now, that one incident has fired me up, and I've been trying to find similar incidences ever since.

Brzezinski: Only if you start measuring money spent on technology per class of person, such as sales or clerical, but then how do you assign credit to that?

In our company, it's getting to be looked upon more and more as a tool, and I like that. There is still the necessity to have to plan to install a technology, so it doesn't get out of hand. But it is becoming more imbedded in the day-to-day process.

Baker: A lot of applications have

Continued on page 48

Life-sized COBOL

SORT 10,000 100-byte records in 43 seconds.

Load 10,000 100-byte keyed records in 36 seconds.

Compile a 10,000 line program in 76 seconds.

Search a 10,000 line source file in 16 seconds.

Hundred-line COBOL programs are common in benchmark tests. In real life, you deal in thousands of lines. So does REALIA.

REALIA is the fastest micro COBOL. It can handle the biggest files. But speed and capacity are only the basics. The compiler, GSA-certified at the high level, offers IBM VS COBOL compatibility and supports ANSI 85 features, such as inline PERFORM and END-IF.

COBOL programs can call DOS, C, and assembler subroutines, as well as accessing BIOS functions via the machine-level interface. The indexed file system handles multiple alternate indexes, with a maximum record

size of 32Kb. The interactive symbolic debugger works on your native generated code, instead of requiring an interpreted version. The full-screen editor imposes no limits on file size.

The programs you write are yours to distribute: REALIA charges no run-time or royalty fee.

REALIA gives you the tools you need for real-life development and maintenance projects. Fast, high-quality phone support. Automatic shipment of upgrades, free for the first year. An introduction to the independent REALIA User Group. A 30-day evaluation copy, for qualified companies. Call us.

Get Realistic about COBOL.

REALIA
inc.TM

10 South Riverside Plaza
Chicago, Illinois 60606
(312) 346-0642
Telex 332979 REALIA INC.

\$995 includes the compiler, Interactive symbolic debugger, editor, and a year of free upgrades and support. Visa / MasterCard / American Express accepted.

REALIA™ COBOL requires MS-DOS™ 2.00 or above; an IBM PC™ PC-XT™, PC-AT™, 3270 PC™, or compatible; and at least 160Kb of memory.



DATA GENERAL ASKS: WHAT WILL YOUR OFFICE SYSTEMS COST YOU DOWN THE ROAD?

OUR CEO® BUSINESS AUTOMATION SOLUTIONS
GIVE YOU THE LOWEST COST OF OWNERSHIP.

Bypass the high cost of other companies' office automation systems. With Data General's line of fully compatible computers. The industry leaders in productivity.

Our new MV/20000™ provides superior price/performance. Better than DEC's VAX™ or IBM®'s 4300 series. While our MV/2000DC™ sets the standards for departmental computing systems.

We take you beyond office automation. By integrating

mainframes, PC's and applications into our industry-leading CEO Business Automation. And by cost effectively distributing your information resources.

We also protect your investment with our commitment to industry standards in communications and data management.

It all adds up to advanced Business Automation solutions. To give you the lowest cost of ownership.

All of which makes Data General the best route to take. For more information, call 1-800-DATAGEN (in Canada call 1-800-268-5454). Or write: Data General, 4400 Computer Drive, MS C-228, Westboro, MA 01580.

© 1986, Data General Corporation, Westboro, MA. MV/20000, MV/2000DC are trademarks, and CEO is a registered trademark of Data General. IBM is a registered trademark of International Business Machines Corp. VAX is a trademark of Digital Equipment Corp.



Data General
a Generation ahead.

"What if..."

*...an office information system
truly integrated your PC users,
dramatically expanded
their capabilities,
combined office automation and
distributed data processing,
and made you
look like a hero?"*



Now there's an office information system that does. The Personal Productivity Center (PPC) from Hewlett-Packard.



The PPC puts PC users (including IBM) to work in one cohesive, integrated system. They can access departmental data, send electronic messages, share sophisticated peripherals, and distribute information.

What's more, they can do all this without ever leaving the PC environment. And without sacrificing what PC's do best: word processing, spreadsheets, graphics and the like.

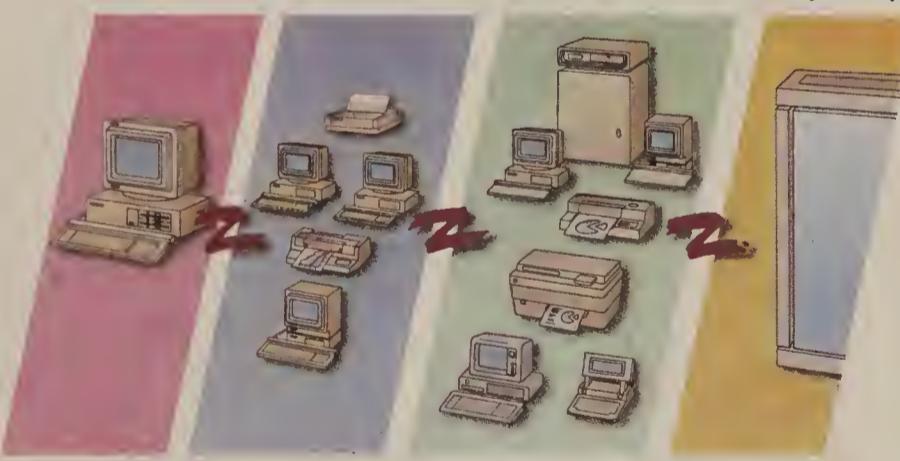
At the same time, the PPC brings a full range of office capabilities to your terminal users. They can share and exchange information with your PC users just as easily as the PC users communicate among themselves.

The PPC is based on the scalable, compatible HP 3000 family of minicomputers. So you get a wide range of solutions, from individual workstations to local area networks to departmental systems. And with HP AdvanceNet, multiple PPC's can be networked to give you a company-wide solution, even linkable to IBM mainframes.

Yet no matter what size you are, or grow to be, the PPC preserves your control over which users have access to which data.

So, if you want to maximize the PC's potential, consider the Personal Productivity Center from Hewlett-Packard. Consider, too, its full range of quality HP products (including the HP Vectra PC). And consider that only the PPC gives you the HP commitment to service and support—as well as the people who never stop asking "what if . . ." about how best to serve your needs.

THE PERSONAL PRODUCTIVITY CENTER (PPC)



A full range of compatible office information products that fit individuals, groups, departments or entire corporations.

For more information, and the telephone number of your nearest HP sales office, call 1 800 367-4772, Dept. 282M today.



**HEWLETT
PACKARD**

Business Computing Systems

Executive Roundtable

Continued from page 44

to be supported intuitively.

Danberg: As far as the tools are concerned, I would suggest that 10 years from now, you're not going to be able to hire the kind of professional you want without supplying the workstation. Just like you can't hire the kind of secretary you want today and say, "Here's a Selectric typewriter."

How many of your people now use a workstation?

Danberg: Of the professional people that are involved in strategic planning or financial planning or analytical activity, the number is probably in the high 85% to 90% range today. But they're a small cadre of people. That's going to increase as we tend to distribute the computer

responsibility — human resources systems to the human resources function, accounting systems to the accounting folks, manufacturing systems out to the manufacturing shop floor.

Are you upgrading the systems constantly, going from an IBM Personal Computer XT, for instance, to a PC AT?

Danberg: Yes and no. We look at each one individually. That's the dilemma — the cost-effectiveness. There comes a point where you download so much data that you've exceeded what was originally a small microprocessor support system; it's now become a functioning system. We try to measure it in terms of exposure: How much exposure does it have? What would happen if it

didn't function? We try to exercise control at that level. But there's no answer to that one.

Is there a demand for more processing power on the part of the managers — everybody wants an AT power machine?

Brzezinski: Quaker's gone through a conscientious replacement of more power in certain areas of the company, because the functionality has definitely increased. We put the older machines out to first-time users.

So the low-cost AT clones must be very appealing to you.

Brzezinski: Yes, they are. The vice-president of investment relations just got hers and sat in her office last week and kept saying, "Wow, is it fast."

The PC revolution: Caught by surprise

As you look back on it, did you handle the influx of PCs as you would have liked? Were you caught by surprise, and would you manage it differently today?

Brzezinski: We all went through some learning, no doubt. It depends how fast you adjusted your learning to the reality of the situation. At Quaker, we were very fortunate in that we set up an information center which was probably one of the best ones I have ever seen in the industry. I was not at Quaker at the time it was set up. It was very service-oriented with the objective to educate people.

That was the turning point at Quaker. It has been nothing but positive since then, and that has been two years. We've got six full-time people staffing it. My biggest concern right now is how to refocus that activity.

Corea: We really didn't have a significant PC problem. We were fortunate, likewise, in that in 1983 — when we started looking at end-user computing and we formed the office information system department and end-user support group — we had probably 15 to 20 PCs in the entire corporation.

We had elected to take a departmental computer approach, where we got superminis and then distributed workstations off of that. So what we did was to come up with the three-tier approach. Now what we're finding is that when users come to us and say, "Here's our application," we either direct them to the mainframe, mini or to the PC where the PC makes sense.

Another advantage that we had is that with the system that we selected, we could use existing PCs and they could become satellite terminals on the departmental computer. So, in essence, they had their own computer power on their desks, plus the ability to get into the network and have all the capabilities of office automation. We were fortunate in that we didn't have an uncontrolled growth that we had to react to; we were able to plan more for it.

So you feel like you've got the handle on it now?

Corea: I think we do. It was a little bit of a stepchild for a while, and it wasn't given the attention that it should have gotten, because there weren't that many of them. I said to myself, I've got 1,200 other workstations and 25, 30 or maybe 40 PCs now, so they were kind of pushed off to the side. Now we can form another group which is exclusively dedicated to PC support for training, implementation, review of hardware and application development.

Brzezinski: How many do you have there?

Corea: We have probably 50 to 60 now. The majority of them are on the [Data General Corp.] network.

Brzezinski: We've got about 800. Until the technology stabilized, [Xerox Corp.] was very big; [Burroughs Corp.] was very big when they first came out. Unfortunately, when the IBM system came out, it became a natural standard that everybody wanted just because it was IBM. In retrospect, that was probably the best thing that happened to us. But

WALKER SPEAKS DATA BASE

LIKE A NATIVE

IDMS. DATA COM. ADABAS. IMS. With Walker financial applications systems, you name the language. And Walker speaks it. Not superficially, but "in the Native Mode."

That's right. In the Native Mode. Regardless of your data base or data dictionary, Walker's General Ledger, Accounts Payable and Purchase Order Systems treat them all the same. With ease.

It's that simple, really. With Walker's financial software, no matter what your shop standard, you can take complete advantage of the full functionality of your system.

With Walker's unique Strategic Software architecture, you won't need a translator for your data base, anymore than you need one for your morning paper.

Learn how your financial applications software can be taught to speak data base like a native. Call or return the attached coupon today.

Walker Interactive Products
100 Spear Street, 3rd Floor San Francisco, CA 94105

- Yes, please send me more information on Walker's family of financial systems.
- Please contact me for a demonstration.

Name	Title
Company	Phone
City	State Zip
IBM Mainframe	Software Environment

For more info: call Barbara Bond at (415) 495-8811

IDMS is a trademark of Cullinet Software Inc. DATACOM is a trademark of Applied Data Research. ADABAS is a trademark of Software AG. IMS is a trademark of International Business Machines.

WALKER

Executive Roundtable

trying to standardize at first was a little bit of a mistake. You recover from it very fast. But something had to be done, and we were all learning.

Do you still have these isolated boxes?

Brzezinski: Sure. In some cases we're letting some of our programmers use them at home. Or, where we find a specific need, we can still get mileage out of them. But a lot of them have been around three, four or five years at this stage.

Baker: For about 10 or 15 years, we had a very rigid, centralized processing arrangement. Everything had to be done centrally and the approval process or purchasing of data processing equipment was all centralized. Three or four years ago we began to liberalize, and finally we realized that the manager who can buy a car might as well be able to buy a PC. If he's smart enough to buy an automobile, he probably ought to be smart enough to buy a PC.

The main thing that happened was that a lot of the equipment that had been bought under the guise of turbine bearings or word processors was reclassified as to what it really was. We had generating plants with maintenance information systems being run on word processors. It took six or eight word processors to do it all, but those engineers will find a way to do it.

Corea: That's the key. The end user is going to find a way to do it, either with you or without you. Ideally, it's going to be with you, and

“
We've told vendors, ‘If you, in fact, come in and talk to our users and we find out about it, then we're no longer going to do business with you.’”
— Beneficial's Luciano Corea

the sooner we realize that, the better off we're going to be.

Baker: It was about seven or eight years ago that I heard a story about a consultant who went to see a banker, and the banker assured him that all his data processing was centralized. The consultant said, “Are you sure you don't have any small minis or micros sitting around?” He said, “I'm sure.” The consultant looked through the bank and found 56 different systems hidden out there.

Is that still going on in some organizations?

Corea: We have central ordering. There's no way you can guarantee that somebody can't get a PC, but we have an agreement with our accounts payable and our purchasing people that any type of PC equipment should come through our area. It's not so much that we want to control what you do, we just want to understand your application a little bit to make sure you're getting what you need to accomplish your task.

Baker: MIS publishes a list of supported devices and software, which means they've got somebody who knows something about it and can

help. But if it's not on the list, it doesn't preclude somebody from buying it.

Brzezinski: The biggest reason for the client's trying to use a centralized service right now is that the acquisition, as we all know, is only the small part of the overall cost. With your maintenance cost and your discounts on software and all, it's to their advantage to go through the centralized approach. I don't find any cases right now where people are trying to go around us at Quaker.

Baker: I don't know of any. It's just not necessary.

Brzezinski: Exactly. Attitudes changed on both sides, and it's healthy.

That's for the purchase. What about for writing applications?

Brzezinski: Writing applications is their responsibility. If they need help and support, we will train. But we will not take on the responsibility of writing the applications.

Baker: Ron [Brzezinski] made the point that they refer to the users as clients at Quaker, and we do that at Georgia Power, too. In fact, when I got involved in it about a year and a

half ago, one of the criteria for the managers in the MIS organization to be judged on was how many of their clients they took to lunch. It's necessary that they market their services just like any of the other consultant organizations do. It's for the benefit of the company that they use all of the marketing tools that any other sales organization ought to use. MIS no longer has a captive market in any big organization.

Brzezinski: That's nice — a lunch. I've got a full-time client service manager, and he has no people reporting to him. He reports to me. And his whole responsibility is our relationship with the clients.

Baker: We have a client support department that used to be the systems development department. The foundation systems in our company are run by the mother company, Southern Co., and we used to have a systems development department, with about 70 people in it, whose purpose was to interface between the users and the mother company.

I, we did away with that department, and we changed it to the client support department. Our ambition is to have a tag on every PC or every terminal with a name and phone number of somebody from client support. If you have a problem, you can dial that number. That's the optimum situation.

Do any of you have a micro manager, PC coordinator or some equivalent as part of MIS?

Continued on next page

Why is Stouffers hot for Zeke:



files, and dispatches batch jobs automatically. It takes quite a burden off us!"

Faster throughput. Fewer reruns. Greater productivity.

Zeke works for Stouffers.

Why not put Zeke to work for you?



The scheduler that works.

The thought of life without Zeke automated scheduling gives Stouffers a chill. "Our operators rely on Zeke," says Data Center Manager Craig Kodat. "They don't want to go back to the old way of doing things."

"Zeke prevents out-of-order submissions, provides for automatic restart and restoration of

SOUTHWEST SOFTWARE

Software that works.

813 Great Southwest Parkway Arlington, Texas 76011-5428
(817) 640-8911 (answered 24 hours a day) 1-800-227-7774 (outside Texas)

ADVERTISE IN THE ONLY COMPUTER PUBLICATIONS FOR THE PEOPLE'S REPUBLIC OF CHINA.

China Computerworld represents the first joint venture in the People's Republic of China between a foreign publishing company, CW Communications/Inc., and the government. China Computerworld is published twice a month and reports on computer hardware and software technologies. The total paid circulation is 70,000. Total readership is estimated at 2,000,000 copies with total distribution of 100,000 copies per issue.

And, now there's China Computerworld Monthly, a sister publication to China Computerworld, that provides 30,000 readers with even more in-depth analysis of the market.



CW COMMUNICATIONS/INC.

Frank Cutitta
Managing Director
International Marketing Services
CW Communications/Inc.
375 Cochituate Road
Framingham, MA 01701-9171

Please send me more information on:
 China Computerworld
 China Computerworld Monthly
 Your other foreign publications

Name _____
Title _____
Company _____
Address _____
City _____ State _____ Zip _____

Executive Roundtable

Continued from previous page

Brzezinski: Our information center manager is that. And it's a direct report to me. All the purchasing per se, the administrative aspects, goes through the purchasing department.

Is there a computer specialist within the purchasing department now?

Brzezinski: No, we provide everything right up until the point of negotiation, and

they just take on the contracts because they're pretty good at that.

Corea: We do all of our own within the office information systems side of it. As a matter of fact, we just hired a person from Entre Computer Centers, Inc. It's amazing how much money he saved us in a week just because he has been in the business, he knows the profit margin and he has negotiated with people. Where we

were getting 22%, he says it's either 30% or it's nothing. And we've gotten 30%.

What is his title?

Corea: He is an information center PC analyst. We've broken it down into basically three groups. We have an information center, and that consists of decision support, fourth-generation language and personal computing. Those three groups report to an information sys-

tems manager. We have one number to call into the information center for any problem. Someone within that group will get back to you within 10 to 15 minutes.

Vendors: Friends or foes of the end user?

Do you allow the vendors to interact with end users at all?

Corea: No. As a matter of

fact, we've told them, "If you, in fact, come in and talk to our users and we find out about it, then we're no longer going to do business with you."

Brzezinski: Wow! I encourage it. Definitely. We could not have done a lot of the things we have accomplished had not our clients worked with vendors. We cannot be all things to all people, and I do encourage it.

I hear the word 'education' over and over. Have you become more teachers than technicians?

Brzezinski: Since November of last year, we have trained over 800 people in one- and two-day courses. We have an ongoing education program. There's a tremendous amount of education. We've got two classrooms set up with PCs. We have eight to 10 people at all times in those classrooms. We go out to our plant areas and do that. But once you get that, what do you do?

Baker: The name of the product sort of implies a difficulty with a central MIS — that is, "personal computer." It is personal, and the use is going to be driven by the attitude and the ability of the individual sitting down in front of it. That's one of the major things we've really been focused on.

Tracking end-user satisfaction

How do you track end-user satisfaction?

Brzezinski: I don't relate to that at all. The only thing we can track is our service to them. But the majority of the activity that goes on is under their direct control. So how do I track whether you're happy today or not? Nor do I care whether you're happy. I mean, yes I do, but there's a lot of other things we have to attend to. By defining the service you're providing and tracking how well you do on that service level, we have our measures and reports. But the service is certainly not on developing and supporting the application.

Corea: We have regular meetings we call information center coordinators. We have a large electronic mail interface, so we go out and attempt to solicit information. And one thing users aren't shy. They are willing to tell you. And it gets back to . . . Are you willing or can you react to the problem being presented to you? Again, you have to evaluate one user's needs vs. the greater preponderance of them. You may have one or two users who are not totally happy, but then you have 95 others that are.

So you don't have a formal



UNTIL NOW, COMBINING SYNC AND ASYNC NETWORKS HAS BEEN A PRETTY AWKWARD AFFAIR.

CASE's DCX Multiplexers blend your sync and async traffic into one datastream without spilling a drop.

Now it's easy to pipe sync and async data down the same leased lines. And make room for more traffic in the process.

With CASE DCX Multiplexers.

The DCX system eliminates the need for outboard protocol converters, extra wiring, separate power supplies and other makeshift "solutions" that can make a plumber's nightmare of your data network.

With DCX multiplexers, you can pipe DEC peripherals into an IBM network. Exchange data between an IBM host and an HP system in another country. Mix async and SNA/SDLC or bisync traffic without polluting your data or slowing your flow. You can even use your 3270 sync terminal to access an async host.

With integral protocol conversion, DCX pumps your sync traffic through a 32-port gateway that doesn't tie up a single comm line. Among other things, this feature allows inexpensive async terminals, including printers, to act like synchronous terminals for your IBM host.

With poll-elimination, DCX cuts out the polling messages that clog up leased lines on IBM networks. This reduces the volume of sync traffic by up to 80%.

Which makes room for all kinds of pure and unpolluted data — including async traffic like interactive graphics, CAD imagery and additional control units. All without degradation to IBM or non-IBM users.

In fact, DCX benefits read like a DP/MIS wish list: dynamic port selection, easy access to X.25 packet switched networks and outside IBM hosts, simple file transfer, security. Even network management.

With DCX, your network is completely *future-proof*. Because the DCX design is so flexible and open-ended it can grow and change just as fast as you do.

Your network can start with a simple 4-line point-to-point mux — and evolve to include everything from LANs to international data networks.

One CASE customer has grown a DCX network that links more than 28,000 terminals to more than 100 computers in more than 50 countries. And that's only half the potential capacity of the DCX system.

If you're ready to pump more different kinds of data down fewer pipes with less pollution, call CASE toll-free at 800-824-4000, extension 332.

CASE
Future-Proof
Data Communications™

© 1985, CASE COMMUNICATIONS INC.

CASE COMMUNICATIONS, INC., 7200 Riverwood Dr., Columbia, MD
Telephone: (301) 290-7710, TLX: 684-9120

Executive Roundtable

form that users fill out at the end of a project?

Danberg: Where client computing is of a class where it's application- or process-driven or performing a function, you indeed have the obligation to assist and support and evaluate the effectiveness as a support to them. We find that our users welcome that, they want it. They don't know how to do it. They see that success breeds success. And if they are able show successful PC applications, they are able to pyramid on that.

Brzezinski: We don't really have that many pioneers out there. People want to find prepackaged solutions. You do encourage some pioneering, very definitely. That's where you get a lot of your ideas. But most of the clients out there do want to leverage off of what's already going on.

Baker: Being an engineering-oriented company, most of our professionals are pioneers. The younger engineers in particular have a very broad computer background that they got in engineering education, especially electrical engineers.

"

It is middle management that I'm concerned about — trying to get more enthused — because there is where you are really going to get your payoff.

— Quaker Oats' Ronald Brzezinski

We have nine different computer centers, and those came out of the engineers' own efforts to do their own thing. Engineers will be more apt to run out from under you than others, like financial or accounting.

Danberg: It's a cultural thing. The culture dictates the environment. We, being a financial institution, are by nature very control-oriented. And our operating management is reluctant to try a lot of new innovative things unless they get the support of the traditional organizational elements.

Baker: Again, that's a generation thing. Harvard University, just a couple of years ago, starting making all the MBA candidates buy their own computers.

When this generation of MBAs begins to integrate into the business environment you'll start to see the change.

Brzezinski: Grady [Baker], you can probably not hire engineers and put them into a computerless environment.

Baker: No way. They would feel lost. In fact, I was

talking to the head of the electrical engineering department at Georgia Tech, and he was complaining bitterly about the fact that he just got a budget cut.

And the cut he was complaining about was not money, but they had cut his mainframe access time: "How can I train electrical engineers if they can't have their terminal time?" Those are the people coming out, and they will have to have

available to them the tools that they've been trained to do the job with.

Senior management support: Is it crucial?

Do you feel you are getting support from top management that you need to service end users?

Corea: In our organization, it started at the top. We put our system in and our

chairman of the board and all of our senior management were in the first group to go on that system. In essence, they are saying to the corporation, "We believe in it. We're going to be a technology-driven corporation, and the fact that we are going to be the first people on here should give direction and insight to the rest of the executives that get on board or get left behind." That's one of the keys to success. End-user

training, top management support — without both of those, it's not impossible, but it's a heck of a lot more difficult.

Do you consider MIS now to be part of top management?

Corea: As a matter of fact, my boss, who is president of Beneficial Data Processing, is on the operating executive committee, and the vice-

Continued on next page

Shouldn't you be a Subscriber?

If you want the complete inside story on the information management revolution, there's only one publication you need:

COMPUTERWORLD.



COMPUTERWORLD makes you an insider!

COMPUTERWORLD is the newsweekly computer professionals read. It's also the weekly for people in all areas of management who need to know what's going on, who want to be plugged into the information-management revolution.

COMPUTERWORLD is the source! Hardware. Software. Systems. Updates. Revisions. Add-ons.

COMPUTERWORLD is comprehensive. It covers micros to mainframes. Manufacturers. Systems. Applications.

COMPUTERWORLD puts it in context. What's new. Who's it for? What's compatible?

COMPUTERWORLD helps you decide. Buy it now or later? What do you lose if you wait? Is there something better on the drawing boards?

Subscribe Today!

There's no time for mailing coupons. For fast start-up, phone the toll-free number below and start your own subscription today at the special professional rate. Just \$38.95 for 51 weekly issues of COMPUTERWORLD . . . plus, 10 in-depth, single-topic issues of COMPUTERWORLD FOCUS at no extra charge. A bonus. A bargain. Indispensable!

1-800-544-3712*

COMPUTERWORLD is for users!

Written from the user's point of view . . . yours. What's right for your needs? How can you be sure? What are others buying? Are they happy with what they have?

How can you get more and better service and support from suppliers? Should you buy or lease? What are the disadvantages of one product or system vs. another? What didn't the vendors tell you that you need to know? See COMPUTERWORLD!

We have the largest, most experienced editorial staff of any computer publication. Full-time bureaus in four U.S. regions, plus Paris and Tokyo. A worldwide editorial staff of over 400 editors and reporters. Information is our subject and no one is more adept at gathering it.

Executive Roundtable

Continued from previous page

chairman of Beneficial Corp. was the past president of Beneficial Data Processing.

Is that a recent development?

Corea: No, it happened in 1978. We admitted that without technology, without our computer-based systems, we're not going to survive into the '90s. It has become the heart of the financial organization. I suspect in your areas too, without those systems and without the ability to get the competitive pricing . . .

Danberg: We're evolving into it.

Baker: That brings up one of my favorite subjects. Time after time we're willing to spend megabucks building systems to support our clerks and our professionals. But I haven't seen a lot of effort being put

forth to make the job of executive management any easier. My advice to MIS managers is if you want your Hay points to be higher or your titles to be better, then I would pay a lot of attention to what my executive vice-presidents and presidents are concerned with and see if I couldn't develop some solutions for some of their problems. These people make decisions. That is what they do for a living. And I haven't really seen a lot of applications to make that decision making easier.

Brzezinski: I would suspect that in the financial-related industries you don't find that argument as much as you may in a technical industry like yours. By the sheer nature of your business, you have a lot of techies, and they are more concerned with their own environment. In financial

companies, you'd find a lot more of the executive solutions already being computerized. We happen to be somewhat of a marketing organization and again, like Lou [Corea], it started at the top. Top management support or involvement is not an issue when it comes to end-user computing.

Baker: What do you do for your president to make his life easier?

Brzezinski: We put on a complete financial analysis and a data-browsing capability that our chairman is the first one to use. He has it at home. And our president uses it at home. They like to browse. They don't like to program. We aren't trying to force them into the programming mode. We keep adding more and more data. They can virtually access the type of data they want

within the pace and acceleration with which they want to receive it. As they grow into using more, they'll get it. The point is, you don't go ahead and prepackage big solutions for them and say, "Now learn this." This has been going on for three years now with our executives, from the chief executive officer on down.

Baker: I have a philosophy that any application for a senior executive that requires more than one finger to implement on a computer is doomed to failure.

Brzezinski: I disagree, because it's a personal thing. It depends on the personal aspirations of the CEO. Our CEO likes data, he's a data enthusiast and he likes to browse. But he is not into the idea of programming. So we give him all the data he needs. We make access to it and package it nicely for him. And whether it's one finger or two fingers . . . What if someone came into you and said, "You're an executive and all you can have is one-finger applications." Would you be offended?

Baker: My hobby is assembler language programs.

“

'The awe with which the upper echelon is held prevents people who have the tools from saying, "You need something and here's where I can help you.'"

— Georgia Power's Grady Baker

Mark Your FREE Calendar For COMMUNICATION NETWORKS '87

February 9-12, 1987
Washington Convention Center, Washington, D.C.

Fill out and return the coupon below to get your FREE CN '87 pocket calendar* so you won't miss the 9th Annual Communication Networks.

CN '87 promises to be the largest conference and exposition ever, offering a telecommunications forum where the most vital issues are discussed by users, carriers, vendors, and policymakers. Last year, CN '86 was a proven success with over 300 exhibiting companies and 15,000 attendees.

Each day offers you useful, practical information — effective ways to deal with the constant changes in voice and data communications you'll face in 1987.

Monday, February 9th

Offers a full day of introductory and advanced "in-depth" seminars that deal with the latest facts, concepts and changes in the telecommunications industry that will affect your job.

Tuesday, February 10th-Thursday, February 12th
You can choose from more than 75 conference sessions over three days all designed to give you a broad perspective on every aspect of modern telecommunications use, management and regulation.

The exhibits alone will be an education. On Tuesday through Thursday you can compare new products and services offered by some of the world's leading companies with over 1,000 booths displaying new applications and top service equipment.

Be prepared for the telecommunications industry's new applications, technologies, and market challenges in 1987 — attend CN '87.

**For your FREE calendar, fill out the coupon below and return it to:
CN '87, Box 9171, Framingham, MA 01701-9171.**

YES, send me my free 1987 pocket calendar and I want to learn more about the Communication Networks '87 Conference and Exposition.

Please send me information on: Exhibiting Attending

Name _____

Title _____

Company _____

Address _____

City/State/Zip _____

Phone _____

CW1

Communication Networks is produced by CW/Conference Management Group a division of CW Communications Inc., publishers of Network World and Computerworld, 375 Cochituate Rd., Box 9171, Framingham, MA 01701-9171.

* Limited supply available.



Making life easier for top executives

Baker: Let me ask you another question. I buy software as a hobby. I see an ad in a magazine, and I'm on the phone with a Visa card and stuff is coming in and most of it is very trashy.

Do you do things to make the mundane things in the office easier for the executive? You've got word processing for the secretaries, which enables them to spend more time with their nails. What do you do for the executive?

Brzezinski: I went to our executive management and put on a workshop

Continued on page 54

BATCH. BATCH. BATCH.

Batch isn't such a dirty word in the VM environment anymore, now that there is VMBATCH.

In fact, batching is the *only* reasonable way to handle certain jobs.

GO AHEAD AND BATCH...

With the new VMBATCH you can batch to your heart's content in the VM environment...without the hassle and expense of keeping a guest operating system around.

VMBATCH allows you to efficiently submit, query, cancel and monitor batch jobs...and cut the time that your Data Center people spend handling user requests. VMBATCH will even process multiple tasks concurrently, offering users greater flexibility.

WHEN END USERS BATCH...

In fact, with VMBATCH, much of the work is done by the end users themselves with three separate levels of user screens (including easily understood full-screen menus).

VMBATCH has a complete set of screens for users at every level of experience—from novice to expert.

Your users will be able to understand and use VMBATCH in minutes!

But at the same time, *you're* in complete control. VMBATCH gives the Data Center full power to monitor and control the size,

origin, and type of job...and has numerous built-in features to identify and control problems immediately, before your system's efficiency is compromised.

You set the limits, define the rules...and VMBATCH will handle the rest!

VMBATCH even allows you to create pre-determined default job options for commonly run jobs (saving valuable time on routine jobs)...and gives you complete power to define all the who's, when's, and what's of your batch priorities.

Best of all...VMBATCH installs in less than an hour and requires no modifications to CP or CMS.

A SPECIAL OFFER FOR BATCHERS THROUGH AUGUST 31...

VMBATCH is regularly priced at \$9,000. But until August 31, you can get VMBATCH for the special introductory price of \$7,000. And if you are a VMCENTER customer, be sure to ask about the special discount for you.

To order VMBATCH under our special introductory price...and with a free 30-day trial period, phone:

800-562-7100

(703-821-6886 in
Virginia and outside
the continental U.S.)



VMBATCH FROM VM SOFTWARE, INC...THE VM EXPERTS

Executive Roundtable

Continued from page 52

for the chairman on down a couple years ago. And that's after a couple of them already had PCs. The issue was: They need blocks of time to sit down, and most of the really senior executives don't have that block of time because they are busy dealing with people, and so what they want is stuff at home they can use, possibly. And what's happened is they have transferred their PCs out of their office or given them to their secretaries to do routine work.

There's too much hype saying, "Do more for the executive," because you have to find your level of interaction. And I think Quaker is finding its own. It is middle management that I'm more concerned about — trying to get that middle management level more enthused at this

“
I don't think it's the technology. We've got enormous technology. It's the recognition of the needs that's the problem, both by the guy who needs the help and by the person who can furnish it.”

— Georgia Power's Grady Baker

stage, because there is where you are really going to get your payoff, not at the upper one. Now how do you get the payoff at the middle level?

Danberg: Your organizations are larger than the one I represent. I find that my problem is that I don't have people on my staff who can relate to the senior management problem. That inability to relate makes it very difficult to say what kind of support

system they need. My people tend to be techies. They know how to define requirements and, once having defined requirements, build systems. But trying to define business needs and then trying to develop the necessary technological solution to support that business need requires people with unique talents and skills.

What are you doing about it?

Danberg: At the present, pondering it, quite frankly. I don't know the answer. Certainly we don't see the people coming out of the educational institutions today providing it. They've got the basic knowledge, but they don't have the practical operational experience. My own personal feeling is that it's going to evolve. For years, we've faced the dilemma of, How do people migrate from MIS into the business world, into the user departments? I think we're going to see a shift of people from the user departments migrating into the MIS world. And that may be the conduit by which this is going to happen.

Brzezinski: That's exactly it. Because at Quaker, we did not write the executive systems. Our corporate planning department wrote the systems. But they had a lot of training and cooperation from our staff. So we had a team effort going writing executive systems. We don't profess to understand all the executive needs, and they were better positioned to do it.

What kinds of things are your executives looking for from MIS that they're not getting now?

Baker: There is still a lot of work to be done in that area. Providing them with risk-free experience and intuitive data bases upon which to make decisions is an area where a lot of work could be done. Getting the information from people who run the models into the executive's hands is an area that needs work.

I really am not satisfied with the mundane, day-to-day tools that are provided. Most executives spend a lot of time on the phone, and anything you can do to make that better will be appreciated by them. A lot of research needs to be done there. There's a feeling in the organization that these guys have to be great and superefficient, or they wouldn't be where they are. That's not necessarily true. Most of them were lucky — right place, right time. Then they need a lot of help doing their jobs efficiently and effectively. The awe with which the upper echelon is held prevents people who have the tools from going in and saying, "You need something and here's where I can help you."

Is the technology not there yet?

Baker: I don't think it's the technology. We've got enormous technology. It's the recognition of the needs that's the problem, both by the guy who needs the help and by the person who can furnish it.

Corea: I don't think it's sometimes as difficult as we make it out to be. We've got the DG Comprehensive Electronic Office system, so we've got electronic mail. Our chairman has said that that system has made him 50% more productive, just in the short messaging capability. Not to have to make phone calls. Not to have to sit and dictate. Not to worry about spelling.

Baker: So your chairman can type?

Corea: He can type, but he's not a speed typist. But when you get a message from him, you find out that he is more interested in getting answers as opposed to content and form. If I'm sending a message to you, do you care if I spell "saw," "sew" or "sww"? You don't. And what you find is that a lot of the formality goes out of what we have

Continued on page 58

Victory is the bottom line.



All year long you've been striving for it.

Victory.

By outstripping the competition. Cultivating business relationships. Striking the money-making deals. Stretching toward the big reward.

COMDEX/Fall puts you in the midst of thousands of the computer industry's leaders— drawn to the main computer event of the year to see the latest and the best, to buy the fastest and most reliable, to learn from an array of conference sessions run by experts only COMDEX can provide.

COMDEX helps you seal your most profitable deals and lay the groundwork for new ones. And gives you a head start on the '87 race.

Because the finish line is the bottom line.

Call (617) 449-6600 now to reserve preferred exhibit space. Or write to:
The Interface Group, Inc., 300 First Avenue, Needham, MA 02194.

COMDEX® Fall '86
Join The Winner's Circle.
November 10-14, 1986, Las Vegas, Nevada

©1986 The Interface Group, Inc.

Some factory management systems require that your company make a few alterations.



Putting in a factory management information system can be a devastating experience.

But there is one system that lets you gain control of your whole company. Without ripping apart your whole company.

MANMAN[®], from ASK Computer Systems.

It's fully integrated.

So every time you implement a new function, you won't have to drastically alter the system. Or drastically alter your business to suit the system.

It's comprehensive.

So you won't have to start from scratch because the system couldn't cover all your needs.

MANMAN can cover a lot more than this ad can cover.

Its 18 integrated products let you easily control and coordinate all your Manufacturing Resource Planning.

All your inventory.

All your production management.

All your payroll. All your field service.

All told, hundreds of tasks throughout the company, all linked by an interactive information system.

All of which you can put in place at your own pace.

Because MANMAN's modular design lets you implement only those functions you really need. And adapt each function to your unique requirements, using the system's built-in "business policy variables."

So no matter how you go about your business, MANMAN can accommodate you.

Now. And 20 years from now.

Because we continually enhance the system. And expand it, with new products like Repetitive Manufacturing, Quality Management and Service Management. And support it, with a complete customer education program.

But then customers have been educating us for over 10 years. Helping us develop a more effective manufacturing management solution.

Call 800-4-FACTORY for details.

We'll show you how you can tie all the information in your factory together.

And still keep your factory together.

ASK

*Making
factory management
manageable.*

NCR

- Disk
- Communications
- Fault
- Battery

On

ON

NCR

- Disk
- Communications
- Fault
- Battery

NCR

- Disk
- Communications
- Fault
- Battery



OUR ADVANTAGE IN MIGRATION IS CLEAR.

NCR's nit-picking fanatics took a clear-headed approach in designing the NCR Tower® systems. By making Towers fully compatible, from the MiniTower (1-8 users) to the Tower XP (1-16 users) to the Tower 32 (1-32 users), they've provided a clean, clear upward growth path for your customers.

Compatibility across the Tower family lets you easily move your software from one Tower to the other with little alteration. So you can upgrade your customers' systems with a minimum of software maintenance and support.

And just as the Towers communicate fluently with each other, they talk to a host of standard protocols including Ethernet, 2780/3270, SNA and X.25. In fact, industry standards such as UNIX®, Multibus™, SCSI, RS-232 and others are built into every Tower to allow VARs the flexibility they need.

For your customers, it's the path to greater productivity. For you, it's a road to bigger, more lucrative accounts.

And that's just the beginning.

As your business grows, our comprehensive support programs give you the flexibility you need to keep growing. With everything from lead referral programs and single-source service to technical training and financing for you and your customers. And all the strength of a \$4.3 billion corporation at work for you.

Of course, all of this should come as no surprise. It's just another example of our towering commitment to VARs.

At NCR, we've always had your needs clearly in focus.

THE TOWERS.
BUILT FOR SYSTEMS BUILDERS
BY NIT-PICKING FANATICS.



OEM Systems Division, NCR Corporation, U.S. Data Processing Group, USG-1, Dayton, OH 45479. Nationwide (800) CALL-NCR.

© 1986 NCR Corporation. Tower is a registered trademark of NCR Corporation. Multibus is a trademark of Intel Corporation. UNIX is a registered trademark of AT&T Specs subject to change.

Executive Roundtable

Continued from page 54

to do now, because it's expected and it's written and everybody sees it. You also learn that they cut through management layers. If you put workstations on multiple people's desks, you don't need multiple tiers of management to pass things through. The line goes directly from the chairman of the board to whomever he or she wants to send that information request to. And once it comes from the top down the first time, you've broken that barrier and information is free to flow back up to the top. Our chairman has a terminal at home, a portable he travels with. In essence, he's never away from the office.

Baker: People are beginning to write articles today on organizational design or philosophy that say to improve the efficiency of the organi-

zation, you need to flatten the organization and widen the expanse of control. That is such a true statement. That is the sort of thing that end-user support can make possible in an organization. Quick and effective communication is vital to achieving that. You get better and quicker decisions.

Danberg: The technology is here. It's integratable. We're crossing boundaries. If you look at the history

"

'Once communication comes from the top down the first time, you've broken that barrier and information is free to flow back up to the top.'

— Beneficial's Luciano Corea

of MIS, all our systems were based on cost-effectiveness or the cost of doing business. Nobody would deny doing payroll. Nobody would look for the cost-effectiveness of doing a payroll; that's the cost of doing business.

Now we hear the phrases "competitive advantage" and "productivity," both of which are not terribly measurable today. So it requires a belief by senior management that the payback is there. I have to say that's

cultural and it's industry-driven. In the engineering-oriented industries, they recognize that. It's highly management-driven. If senior executives believe there are advantages to be gained, even if they are not measurable today, they'll move forward.

The outlook for the future

What is your outlook for the future of end-user computing?

Danberg: I'd have to say it's a field that's evolving. The problems we will be faced with in end-user computing are the problems we've faced as a maturing industry within DP. We're only a 30-year-old industry, and we've made remarkable strides. The old adage was "large systems, large problems, small systems, small problems." I don't think that holds true. The problems are the same. As we embed data processing into the business process through the use of PCs, we're going to have to be very creative in our outlook, in our approach. It's going to be evolving with changing roles on both sides, all for the better, in my judgment.

Baker: There will be a continuing fuzziness between foundation systems and information systems as time goes on. As communications becomes better and better and high-speed communications becomes available, the large processors will be data reservoirs and the data manipulation will be done at user stations, even the very large number crunching that goes on in mainframe processors now. It all will be tied together virtually at bus speed, and small systems will extract the data, manipulate it, produce whatever is necessary and put it back.

Corea: You will see a blurring between the mainframe, mini and micro environment. It will become transparent to the user. It's not all that far off. You're not going to know where what you're doing is being processed, be it on your desk, on a mainframe or wherever. That will offload a lot of CPU cycles. So you might not see a large growth in host-based processing.

Departmental computers, the 32-bit Digital Equipment Corp. Microvaxes, the DG MV/2000s, are going to play an important role. You're getting a MIPS' worth of power now for \$15,000. I'd rather have one of those than PCs on everybody's desk, where I have to figure how to network them together, how to get data back and forth.

Brzezinski: I look at what's happened as a lot of excitement. Within the last two years in particular, a lot of tools have been put in place to take advantage of the many things we've been trying to do for the last 10 years. We're just starting to leverage a lot of the client community talent, resources and ideas, and we are in a position because of the technology to link all this together.

We're buying tools to drop down everything into PCs and further blur the boundaries. My biggest challenge is to refocus the traditional information center. How do you now position what has been a very successful group of people to take advantage of this next era? Of trying to capitalize on the talent out there in the client communities?

When the IRS needed an office on the road, Zenith withheld nothing.



Now IRS auditors can leave the office with just about everything but the coffee pot tucked under one arm. Thanks to Zenith's amazing Z-171 Portable PC.

PC COMPATIBLE

With dual 5 1/4" floppy disk drives and compatibility with most IBM software, the Z-171 gives auditors in the field access to pertinent home-based files.

But that's only the beginning.

The Z-171 gives the IRS a full-size, backlit LCD screen, with plenty of room for spreadsheets

to spread out. 256K of memory expandable to 640K. An optional built-in modem and rechargeable battery pack, and much more. All folding neatly into a package under 15 pounds.

Find out why the Z-171 came out on top in one of the most thorough audits ever made.

For more information, and the name of your nearest Zenith Data Systems dealer, call **1-800-842-9000, Ext. 1.**

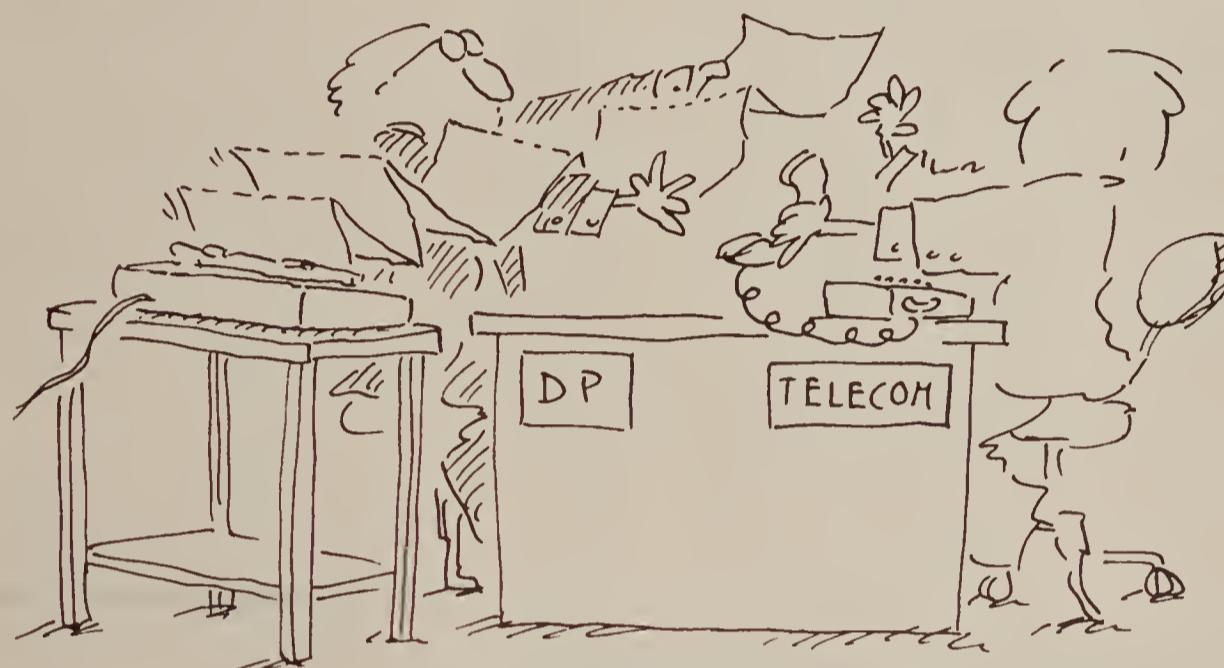
ZENITH | data systems

The quality goes in before the name goes on.®

In Depth

Telecom and DP: Making skills meet

ILLUSTRATION BY CHRIS DEMAREST



The roles needed to manage the integrated technologies are changing, and so, too, should the organization that has responsibility for them.

By PETER G. W. KEEN

For the foreseeable future, the bottleneck in exploiting integrated information technology in general and telecommunications in particular will be the supply of good people, not the supply of the technology itself. This partly reflects the gap between the need and the supply, which has always been a problem in the information systems field. Typical large firms carry backlogs of development projects measured in man-centuries rather than man-years.

Personal computers and end-user software packages have helped cut into the backlog but have created new ones of their own, as supply creates demand. A rough rule of thumb is that 50% to 70% of information systems staff is working on maintaining or updating existing systems, 20% to 40% on enhancing them and only 10% on developing new systems.

When the tax laws change, a business unit adds a new customer service or IBM introduces an improved operating system, existing programs must be modified. The effort can be huge. When the U.S. Postal Service proposed changing the ZIP code to nine digits, calculations of the cost to the Fortune 100 firms of changes to their basic processing systems were in the billions of dollars.

The problems of maintenance and backlog will remain with us for a long time. Software tools for developing large systems are improving, but productivity is increasing at a far slower rate than are the de-

mands for new applications.

This constraint, though, is relatively small compared with the fairly sudden shift in the entire skill base required for the integrated technologies. If one knows a person's job title in information systems, one may have no idea what he actually does or what is the career trajectory for the job. The chart on page 60 summarizes the changes from the era of separate applications in the 1970s to the portfolio of technologies and applications for the mid-1980s and 1990s.

In discussing these changes, the acronyms IIT and IS are used. IIT stands for integrated information technology. IS stands for information systems, the corporate development function for the main computing applications. (The old term was "data processing"; "information management" is a more recent one.)

No standard labels

One of the problems in describing what is happening in the field is the lack of standard labels for and descriptions of the broadening range of jobs, skills and roles involved. The chart gives a flavor of the range. When we are short of people in the professional jobs, the problem of building a new human resources base will be horrendous. It will be worst in the area of telecommunications, especially in terms of finding individuals who combine the following, virtually contradictory requirements:

Strong technical qualifications in digital communications and in the integration

About the author

Reprinted with permission from Peter G. W. Keen's Competing in Time: Using Telecommunications for Competitive Advantage. Copyright © 1986, Peter G. W. Keen.

simple contributions upper management can make.

Organizing the IIT function

The roles needed for managing the integrated technologies are changing and so, too, should the organization that has responsibility for them. In most firms, that organization consists of a central information systems function plus divisional IS units, a corporate telecommunications group and any number of fragmented units that handle some aspect of voice and data operations. The function of the telecommunications group largely depends on the stage the company is in in the shift from a technical utility to a coordinated business resource.

The specific mandate, structure and relationship of IS to senior management and to the wider corporate organization largely reflect the historical development of DP and the communications utility. Very rarely are these a conscious response to the realities of the electronic marketplace. A new approach to organizing IS is needed.

Organizing is not the same as organization. It is easy to draw new organization charts and shuffle jobs around. Organizing implies a much more dynamic emphasis on communicating and on roles — literally, the parts workers play — rather than on tasks.

On the whole, telecommunications and information systems organizations have been defined more in terms of tasks — projects, specialist skills, technical niches and responsibility for specific applications — than roles. The key themes in organizing IS relate to building systems and running corporations.

Coordination, not control

The new roles relate far more to marketing, communicating, supporting and planning. But the old skills remain essential. If anything, solid, reliable operations are more, not less, important when failures affect service and are seen by customers instead of being hidden behind the walls of the data center. But the new information function is a full service function. This means that the following become the tasks for organizing:

- Coordinate the planning, implementation and use of the information resource, balancing central direction with decentralized application.
- Shift the organization for IIT toward being a staff function comparable to corporate finance, instead of existing mainly as a unit that builds systems.
- Amalgamate telecommunications and information systems within the IIT organization as interrelated departments within the information company, not independent functions.
- Use human resource planning to drive, not follow, technical planning and implementation.

The chart on page 62 shows the likely formal organization structure that will result.

No organization chart can communicate the main role of the IIT func-

tion — to find a suitable level of centralization to coordinate the integrated business resource. The main principle for managers of IIT has to be, "Respect the reality of decentralization and establish the criticality of coordination."

Very roughly, this means that the key infrastructures, especially telecommunications, require moving toward centralized direction and that building the applications that carry the traffic and making decisions on what traffic to add should be increasingly decentralized. If the architecture is clear and technical standards are backed up by rules, guidelines and procedures, distributed IS units in the business groups can handle most development needs. This is a very big if.

Guidelines with teeth

B. L. Williams of the consulting firm Arthur D. Little, Inc. provides a useful framework for assessing the degree of centralization of any particular telecommunications organization. He defines a spectrum of decision-making authority ranging from fully autonomous to integrated/centralized.

Each extreme seems undesirable. Autonomy — with every unit making its own decisions —

means that a corporate resource, as opposed to a set of incompatible technical facilities, will never be created. Full centralization contradicts the principle of decentralized decision making, which is one of the most basic realities of

modern business.

The two intermediate positions, guided and coordinated, are unstable — they combine a little of each extreme. They both have many merits, but they can be made to work only if senior management defines a vision to justify them, establishes the policies to make them possible and clarifies the authority and roles of the centralized architect and planning unit and of the decentralized business operations (see chart page 63).

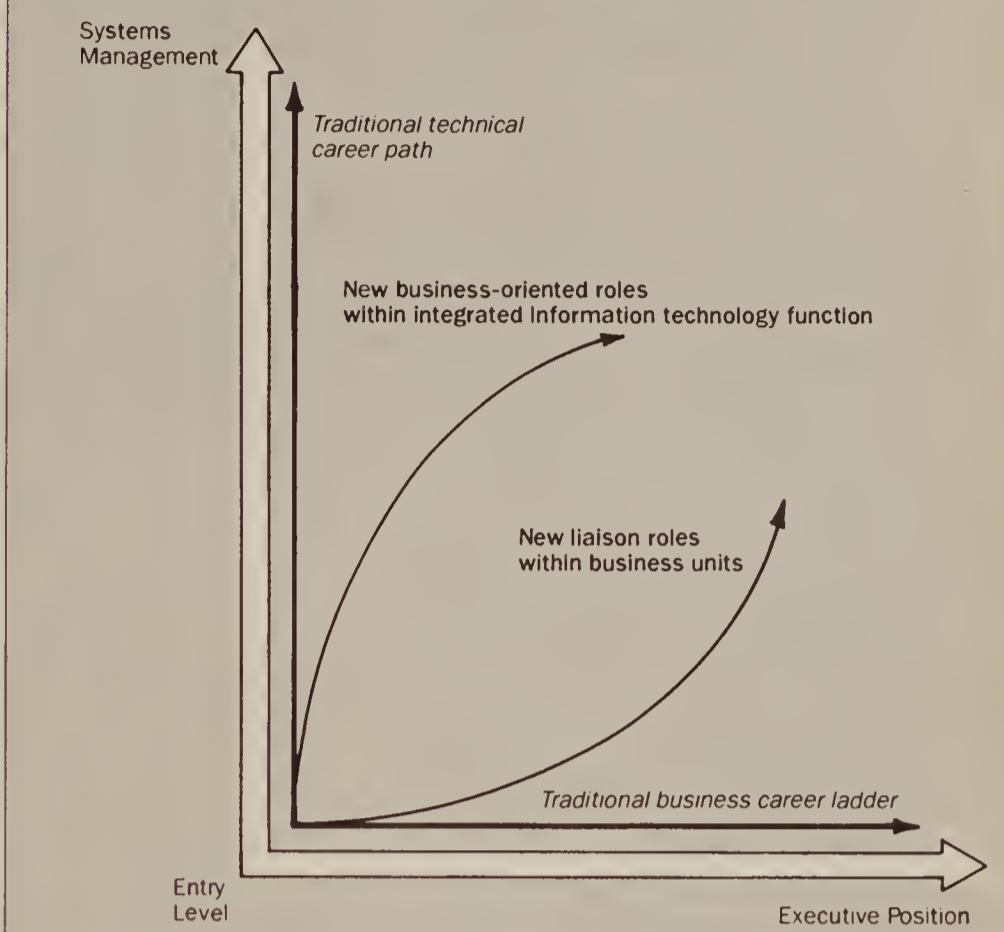
The phrase "guidelines with teeth" addresses the issue of authority. "Standards" is an ambiguous term. It can mean anything from a set of recommendations that can be ignored by business units to a corporate architecture in which no local discretion is allowed. The technical standards may be the same in both instances; the key question is, Who either enforces them or decides on exceptions?

As one telecommunications manager in a major international consumer goods firm discovered, publishing a set of standards does not answer that question. His company, Quintex, Inc. (this is a pseudonym), planned to install a common worldwide financial reporting system. To support this, the manager defined a set of computer and communications standards to be followed by each division in each country in which Quintex operated.

The head of Quintex's Taiwan subsidiary decided not to wait for the new system. The volume of

Charting a new career path

Midway between two traditional career directions, the new information professional faces ambiguous roles and a lack of precedents.



IRMA. KLONE.™ \$595. FREE TRIAL.

100% IRMA COMPATIBLE. MADE IN USA.

KLONE is a low cost, generic replacement for Irma, the micro to mainframe link for IBM 3270 users. KLONE includes all hardware and full emulation software. Any and all programs that support Irma will support KLONE. Configured and programmed from floppy disk, KLONE allows enhancements and upgrades without changing ROMs or disassembling the PC. KLONE is manufactured and backed by Agile, a company with over 8 years experience in IBM product emulation.

30 DAY FREE TRIAL.

KLONE is being offered to you at no risk. If after 30 days use you are not 100% satisfied with KLONE's performance, you may return it at no charge. Call now for info.

800-538-1634

(Inside CA, call collect
415-825-9220)

AGILE

4041 Pike Lane, Concord, CA 94520

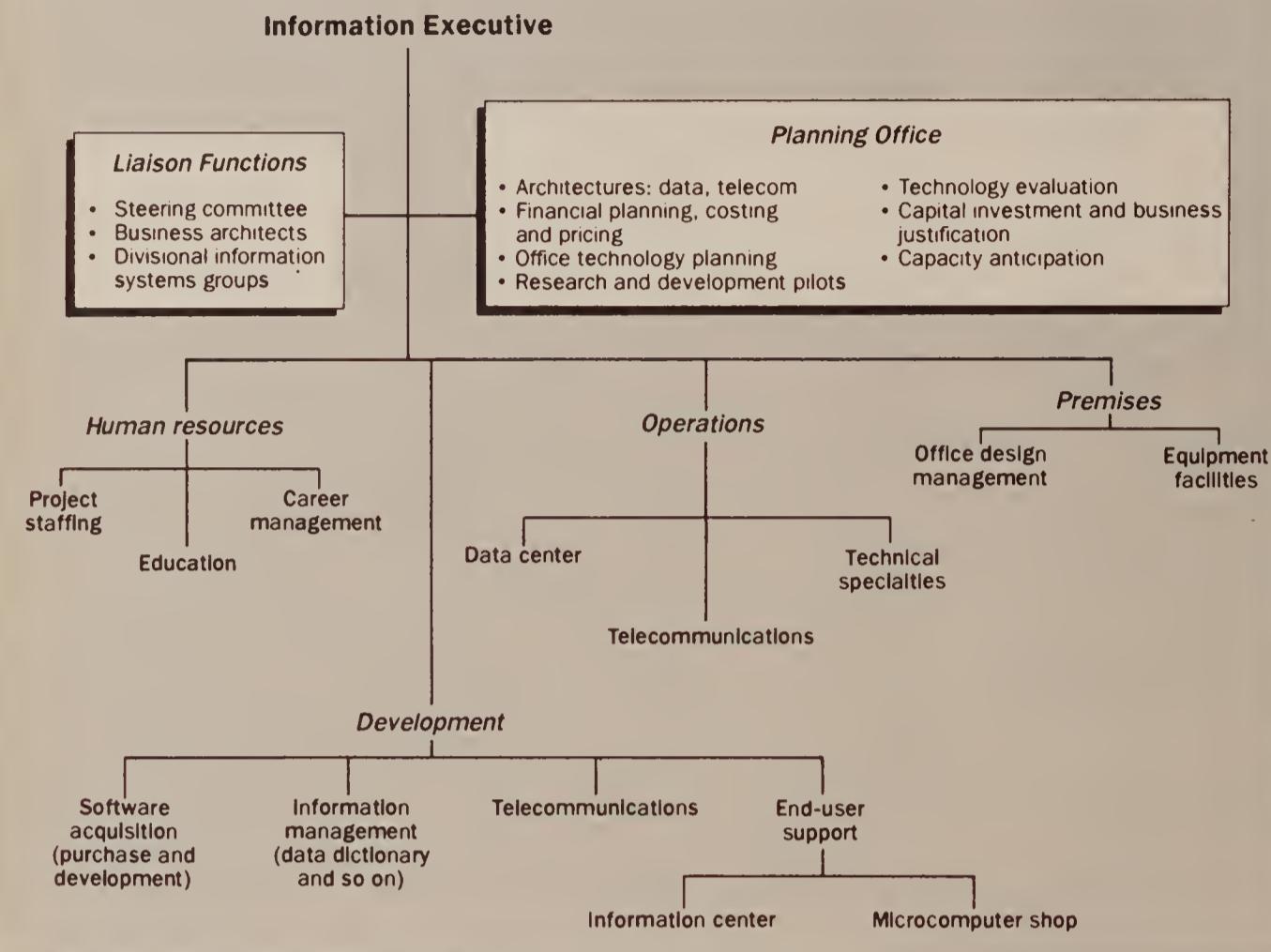


Irma is a trademark of Digital Communications Associates, Inc.

KLONE is a trademark of AGILE

Organizing DP and telecom for the next decade

A new organizational structure can bring together MIS and telecom, separate development from operations, create a strong planning office and enhance the human resources group.



business was expanding rapidly, and existing computer systems were inadequate to handle the unit's needs.

He approved the purchase of a software package that ran on a nonstandard computer and used the equipment manufacturer's non-standard communications protocols.

The corporate telecommunications manager tried to get the decision overridden. He pointed out that he had been given the responsibility to define a company-

wide policy and that Taiwan's action threatened the whole concept of shared computer systems, common reporting and integrated communications.

The head of the subsidiary responded in a memorable telex that he had been given the responsibility to make profits for the firm, that he had immediate needs and did not intend to sit around and wait.

The communications manager responded that the local decision threatened long-

term integration. He argued that it would add costs in the end and slow down the implementation of the worldwide system. He lost the argument, and Taiwan has its independent communications facility.

It is not easy in such instances to decide who is right.

Here it did not matter: The senior business manager had the authority, the communications manager had nothing more than a piece of paper, and might was right. For

would have vetoed the Taiwan proposal and suggested they find an alternative package.

If Taiwan wanted the veto overturned, they would have to make their case to the IS steering committee. He said, "The onus should be on the divisions to justify exceptions, not on me to justify the standards."

The corporate architect

Most large firms have an architecture or are trying to define one; that is a basic

standards to be effective, they have to have teeth.

Quintex's communications manager recognized this after the fact. He asked the information systems steering committee, which set policy for computing and communications, to clarify this mandate.

The manager listed the benefits from the integrated approach and the costs of local autonomy. He accepted that sometimes exceptions would have to be made but argued that he must have, if not the final say, then at least some real influence.

He wanted a preliminary veto: All local systems must follow the standards, and his unit's approval should be required for any deviation from the standard. He

requirement for any coordinated communications plan.

These firms need to make sure they clarify the role of the corporate architect.

At the one extreme — fully autonomous management — the corporate architect is a staff adviser and at the other — fully integrated and centralized management — a controller.

Guided or coordinated management requires a custodian — someone who can guarantee the integrity of the overall architecture while adapting it to special needs and exceptional situations. This means having at least a preliminary veto. Quintex's manager defined an architecture, but his role as an architect was not made clear.

In almost every firm in which telecommunications is seen as more than an internal technical utility, the trend is toward centralization.

This assertion is based on analysis of almost 50 large companies, half of which are U.S. and half European. They come from every major industry.

The analysis is based on published and private documents and was carried out in mid-1984.

The firms include Exxon Corp., GTE Corp., Citibank N.A., Federal Express Corp., Connecticut General Corp., Merrill Lynch, Pierce, Fenner and Smith, Inc., Chase Manhattan Corp., Sears Roebuck & Co., American Express Co., IBM and Lockheed Corp. in the U.S. European firms include Sainsbury and Tesco Stores PLC, Scandinavian Airlines System, British Leyland, Ford Motor Co. in the UK and Germany, Grand Metropolitan PLC and Barclays Bank PLC in the UK.

Regardless of their specific strategies, almost every firm is trying to resolve the issue of how to get centralized coordination. None of them want to push toward more decentralized planning, although most of them favor decentralized network operations. The firms with central units that are most successful politically and technically share the following characteristics:

- The central group plays a strong consultancy role for the other units. The central unit relies on having a pool of first-rate technical staff to encourage the other units to draw on it; rather than try to control by fiat, the central group controls by incentives and expertise.

- They have a clear mandate to design and maintain the optimal topology for the corporate network, supervising almost every aspect of planning and operating facilities that are identified as "corporate."

- They use accounting mechanisms and provide service and support functions to

DEC
RENT • LEASE • BUY • SELL

SYSTEM SHOPPING SPECIALS

VAX® 11/785 VAXCLUSTER ADD-ON 8MB, FP785, CI780, VMS & DECNET LIC \$137,900	VAX® 11/780 SYSTEM SPECIAL 6MB, TU80, RU81, VMS, LIC \$98,400	VAX® 11/750 VAXCLUSTER ADD-ON 4MB, FP750, CI750, VMS & DECNET LIC \$56,100
--	--	---

SYSTEMS INCLUDE INSTALLATION, FREIGHT AND DEC LICENSES

IN-STOCK AUGUST SPECIALS

CI780-AA (Used) \$ 9,900	MS780-FD (Used) \$ 950
FP780-AA (Used) \$ 2,850	RA60-FA (New) \$15,950
H7112-A (Used) \$ 995	TA78-BF (Unused) \$42,850
MS750-CA (New) \$ 1,275	TU80-AA (Used) \$ 5,200

BROOKVALE ASSOCIATES...Our 12th Year
CALL NOW FOR YOUR FREE CATALOG. DON'T DELAY, CALL BROOKVALE TODAY!

YOUR BEST SOURCE FOR VAX® & PDP-11® SYSTEMS

WEST COAST: 800-252-6200
In WA State, 206-392-9878
1495 N.W. Gilman Blvd., Issaquah, WA 98027
TWX: 510-228-7319

EAST COAST: 800-645-1167
In NY State 516-273-7777
265 Oser Ave., Hauppauge, NY 11788

CSDP Center for the Study of Data Processing

DB2 in the Production Environment — The Answers
Codd and Date Consulting Group and IBM Corporation
October 8-9, 1986
Embassy Suites Hotel, St. Louis

Answer	Speakername
Twelve Rules of Relational Architecture	E. F. Codd
Relational Myths	C. J. Date
The Economics of Relational DBMSs	Sharon Weinberg

To register, or for further information, call Kathryn Atnip at 314-889-4556.
Center for the Study of Data Processing

Washington University in St. Louis

In Depth/Telecom and DP

to build a cadre of hybrids. Time the lateral development carefully: It is silly to take someone who has 20 years' technical experience and very limited exposure to the business and expect him to be credible or effective outside that sphere; the vice-president of systems development should not become an overpaid apprentice in marketing.

Conversely, if trainee programmers are shipped out to the finance department, they are of little value, since they have not yet mastered their own trade.

The best time to make the move seems to be between two and five years after a person's hiring. The time spent in the other department should last no more than two years so that the person's old knowledge does not become obsolete.

If 10% of incoming recruits are

targeted for such a process in both directions, the long-term human resource problems for IIT will be solved in about five years. The sooner a firm starts, the quicker the chief bottleneck that hinders the exploitation of technology's opportunities will be unjammed. Good IIT managers and good personnel managers know this. They generally cannot do much to solve it, because it requires both senior management initiatives and clear signals from the top that this is the path for the future.

As for consultants, in all fields there are bad and good consultants, greedy and responsible ones, merchants of hype and solid professionals. It can be hard to tell which is which, especially in new technical areas.

The best advisers often apply their business experience to a new

area involving technology, although they will not have built the systems they are recommending. The top technical specialists apply their insights to a new aspect of business but will not be able to show success in it.

Getting a sense of options

Often senior executives bring in academics or well-known experts to help them get a sense of the main options and issues. When they do, however, DP managers should beware of joining the fad-of-the-month club.

For example, when *Business Week* published a cover story on the coming wonders of expert systems, many IIT managers groaned. The article, like so many on a hot new topic in the field, gave senior executives false expectations about the progress

in expert systems and artificial intelligence. It led to them pushing for action and bringing in experts to talk about what the firm should be doing.

These experts often come from a scientific or academic environment where their experience is with small-scale applications or pilot projects — that is where work in the state of the art is being done. However, they have no understanding of large-scale commercial processing and operations, of organizational aspects of information management.

It is not that their knowledge is invalid — only their extension of their knowledge to the world of business and business uses of technology.

Differences exist between the worlds of scientific/academic and large-scale business computing. In scientific/academic computing, analysis is complex in terms of methods, models and computation. Data structures are complex, but volumes are low; software is advanced. The technical base is a stand-alone or simple time-sharing computer, and "architecture" refers to the hardware. The organizational context is of limited

"

It is silly to take someone who has 20 years' technical experience and limited exposure to the business and expect him to be credible or effective outside that sphere.

EXECUTIVE REPORTS

Special Editorial Features

Every issue of Computerworld presents either a Product Spotlight or Executive Report. For advertisers, it's still not too late to take advantage of the hot topics set for September!

Computer Leasing (Executive Report, September 8) Focuses on the state of the leasing industry, how vendors are reacting, why leasing can be better than buying and what to expect in the future. Also, an examination of the growth of leasing — plus, pros and cons of leasing versus buying and a look at lease negotiations. Closing date August 22.

Financial Modeling Packages for Micros (Product Spotlight, September 15) Examines how standalone spreadsheets are fast disappearing and being replaced by integrated programs or financial modeling packages. The main article looks at what users can do after outgrowing their spreadsheets, and presents the use of a financial modeling package as one solution. Closing date August 29.

Communication Standards (Executive Report, September 22) Focuses on electronic data exchange protocol (EDI), which allows for the direct computer to computer exchange of standard business forms. This report studies the value of EDI in the transmission of purchase orders, invoices and other important documents in various industries. Also, a look at how EDI is strengthening the trade relationships between customers and suppliers. Closing date September 5.

On-line Computing (Executive Report, September 29) Explores the fact that although on-line transaction processing (OLTP) has been around since the 1960s, the market is now heating up with IBM and some BUNCH companies battling a group of young companies for the bulk of the market. This report examines on-line computing with a look at the major players, the current state of the art, and what users want. Closing date September 12.

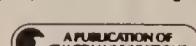
And it doesn't stop there! Important and pertinent Executive Reports and Product Spotlights topics continue through October and November.

ISSUE	TOPIC	CLOSING DATE
October 6	Hardware Roundup/Large & Medium-scale Systems (Product Spotlight)	September 19
October 13	Hardware Roundup/Small-scale Systems (Product Spotlight)	September 26
October 20	Hardware Roundup/Microcomputers (Product Spotlight)	October 3
October 27	Decision Support Systems (Executive Report)	October 10
November 3	*1000th Issue/40th Anniversary of the Computer*	October 10
November 10	PC Graphics Hardware (Product Spotlight)	October 24
November 12	*Computerworld Focus on Microcomputing *	October 3
November 17	Systems Integrators (Executive Report)	October 31
November 24	Vertical Markets (Executive Report)	November 7

Why not take advantage of these special opportunities to reach your customers? Executive Reports and Product Spotlights focus readers' attention — and that strengthens the power of your ads. Call Ed Marecki, Computerworld's Vice President/Sales at (617) 879-0700 — or call your local Computerworld representative — to reserve space for your ad today.

COMPUTERWORLD

Boston: (617) 879-0700 New York: (201) 967-1350
Atlanta: (404) 394-0758 Chicago: (312) 827-4433 Dallas: (214) 991-8366
San Francisco: (415) 421-7330 Los Angeles: (714) 261-1230



PRODUCT SPOTLIGHTS

relevance to a technical decision, and implementation is equivalent to installation. The application is the strategy.

In commercial computing, operation is complex in terms of project management, coordination and procedures. Volumes limit the complexity of data and the practicality of software with high overhead and inefficiency. The operating system and architecture dominate decisions; architecture relates to the integration of the organizational resource. Organizational interactions are driving factors for decisions, and implementation means making the system work organizationally as well as technically. Business operations define the strategy.

Learning by example

Bright people who operate only from experience and assumptions often make IIT managers look like anti-intellectual Neanderthals; these managers are put on the defensive.

Until very recently, the field of information technology in large organizations held substantial barriers to entry: Managers had no experience in the trenches of systems development or telecommunications operations. That barrier has been removed.

The areas in which firms most often need top-level advice are the ones in which such experience is not necessarily relevant. Business planning for telecommunications is one such area. The best advisers will be people who are thoroughly up-to-date on developments in the International Standards Organization's Open

Systems Interconnect and advances in local-area networks, value-added networks or digital private branch exchanges (PBX).

Examples of instances in which the inexperienced adviser says "It's easy" because a concept is proven or a framework is available include large-scale data base management, international standards for telecommunications, implementing local-area networks and voice/data integration. It is not easy to implement these advances, and it is misleading to persuade managers that it is.

The IIT field is grasping for ways of making sense out of the bewildering changes and dilemmas firms face. But the firms need simple, not simplistic, models. How do they tell the difference? The deep and the shallow thinkers all use the same transparencies in their presentations. Conceptual models and mere motions look and sound the same. The deep thinkers have a base of proven results, either their own experience or the successful implementation of their recommendations.

Sometimes a leading adviser, especially on the busy conference circuit, comes up with a useful framework or striking message. That speaker will be in constant demand. The temptation is then to stop learning and to stick with the one idea, well and often wittily presented. Again and again in IIT, good academics and consultants have used up their intellectual capital by turning it into temporary income.

This is a problem of intellectual adolescence. IBM represents the orthodoxy of information technology. Many of the Young Turks in the consulting field are explicitly anti-IBM.

There is a lot of truth in the criticism of IBM. The new IBM is not the old one. It has been the aggressor, not the follower, in the market. With all its faults, it has moved to head off all its competitors — even AT&T — except the Japanese. This now is the battleground.

Most important, it has established its architectures, rather than its products, as the reference for the field. IBM's Systems Network Architecture is the de facto standard. That is why every major manufacturer of computer and telecommunications equipment has adopted it. Its personal computer has never been the best in the field, nor have its office technology products generally matched the best of other vendors.

Experienced IIT managers and planners know all the pluses and minuses of IBM, from the value of the plastic wrapping to the cost of cumbersome operating systems.

For them, the issue is, "If not IBM, then who?" For the new generation of consultants, the response tends to be, "Not IBM." As a knee-jerk reaction, that is as absurd as the stereotypical old-line DP manager's reaction, "Only IBM, of course."

Choosing an adviser

Does this person understand the craft of large-scale information systems and telecommunications development and operations? Has he worked on a really big project (involving at least a dozen people for a two-year period, say) from inception to operational use?

If not, there is a fairly strong risk that he overlooks the complexity of the management process and interaction between technical and organiza-

"

Experienced IIT managers and planners know all the pluses and minuses of IBM. For them, the issue is, "If not IBM, then who?" For the new generation of consultants, the response tends to be, "Not IBM." That is as absurd as the stereotypical DP manager's reaction, "Only IBM, of course."

tional issues in large-scale business applications.

One cannot simply extrapolate from scientific projects that involve small, simple or well-structured data bases, or from personal computers and local-area networks, to an environment marked by a myriad of interdependencies.

What is the candidate's pedigree,

in terms of intellectual base and the quality of the firm(s) he has worked in? The exemplary firms described provide their people with a training ground that in itself adds a value to the employees' own qualifications, job titles and project experience. The same is true for the very best of the computer and communications vendors.

Does the adviser know the field, in terms of the research literature, what is going on in the leading vendor and user companies and what the practical state of the art is? Ironically, at a time when the field of IIT needs a combination of first-rate analytic ability and some mix of breadth and depth in business and technical areas, anyone can become an expert. It is very easy for people to grab at the latest fad term or hot topic and sound convincing. This happened in the early 1980s with office automation and more recently with expert systems. It is increasingly commonplace with business telecommunications, which is among the hottest of all topics.

The reason senior managers have to address the issue of how to validate outside advisers for IIT is simply that they have no choice but to

Tandy® brings it all together.



Today's most flexible local area network for Tandy, IBM® PC and PC-compatible computers.

The people in your office should be working toward common goals, right? Our new ViaNet local area network (LAN) lets you connect your MS-DOS® computers together. It's the "whole is greater than the sum of the parts" idea which is the synergy of ViaNet.

Since your computer is linked with the other PCs in your office, applications and accessories can be shared. So you can get the information you want, when you want it, without walking diskettes around.

Some networks require a dedicated file server—a PC that "serves" the network, but that doesn't serve much other useful purpose. ViaNet lets you use one hard-disk based computer as a file server and for other tasks.

Installation and operation are simple. And putting ViaNet to work in a network can cost less than a single workstation.

We could say more, but we'd rather show you the benefits of ViaNet. So get your department heads together and stop by for a demonstration.

Available at over 1200 Radio Shack Computer Centers and at participating Radio Shack stores and dealers.

Radio Shack
COMPUTER CENTERS

A DIVISION OF TANDY CORPORATION

Send me a ViaNet brochure.

Radio Shack, Dept. 87-A-74
300 One Tandy Center, Fort Worth, TX 76102

Name _____

Company _____

Address _____

City _____

State _____ ZIP _____

Phone _____

*Excepting, of course, confidential files which are kept secure with passwords. ViaNet/TM VIANETIX. IBM/Registered TM International Business Machines Corp. MS-DOS/Registered TM Microsoft Corp.

use them. The same is true within the IIT organization. Bad advisers do damage, however. They raise expectations about what is practical, mislead the organization about the risks and returns and add to fog and fantasy, not vision.

Development and operations

The most immediate change large firms have to make in how they organize the IIT unit is to move from having information systems and telecommunications as separate functions — each with a development and operations unit — to splitting the IIT organization into a development arm and an operations arm, each of which includes both telecommunications and information systems groups.

In many large firms, telecommunications and information systems

“
Bad advisers do damage. They raise expectations about what is practical, mislead the organization about the risks and returns and add to fog and fantasy, not vision.

have evolved on largely separate paths. In addition, the pace of change in communications from voice and analog to digital technology and in information systems from automation of clerical processes and batch systems to a broad range of on-line and data- and communications-oriented applications has increased the fragmentation of responsibilities and authority.

The company then has voice spe-

cialists who do not understand data communications, data communications staff members who disdain data processing as a technically unsophisticated function and DP specialists who view telecommunications in terms of the software requirements for on-line applications. The development staff possesses up-to-date technical knowledge and relatively little experience, while the operations personnel have

the solid experience and an obsolete knowledge base.

The cultures have to be brought together and the organization based on each one's strengths.

In the development arm, the information systems functions include the following:

Software acquisition to build and buy applications. The trend is toward buying packages, end-user software and fourth-generation languages. Standards for system compatibility are important.

Information management. Data is among the most valuable traffic on the network highways, and the delivery of and access to data via telecommunications is a competitive resource. Data base management software and procedures and technology to create the data architecture shift the focus in IS from programming to information resource management.

End-user support. An information center should be a do-it-yourself store for nontechnical people to develop ad hoc small-scale systems and should offer assistance in acquiring and using microcomputers.

First-rate operations remain critical. Reliability, security, response time, smooth installation, maintenance and troubleshooting translate to quality of customer service in the business resource era. When the network is down, the business is down.

The old-timers are not obsolete — they provide a critical skill. Rather than turn them into mediocre development supervisors (and the digital communications whiz kids into ineffectual managers), surely it makes most sense to recognize that strategy needs cables as well as vice versa.

Last but not least: facilities

The final major innovation in organizing for IIT is one whose importance is easy to overlook: the fact that the office of the future is very physical in nature and telecommunications has tremendous implications for office design and administration and vice versa.

Many telecommunications-related functions are controlled by administrative service units, especially at the local level. Now, when an employee moves to a new office, there can be several hours of work needed for drilling and cabling to install a workstation.

Furniture, lighting and desks have to be picked on the basis of ergonomic and health and safety factors for users of terminals. No office can be designed now without careful attention to cabling for local-area networks, PBX and an employee-workstation ratio that is virtually certain to move close to 1:1 during the lifetime of the building.

The information executive needs new authority over many aspects of office design and must supervise any relocation of business operations and control the planning of office equipment and facilities. This aspect of IIT is very different from development and technical operations.

Facilities management has traditionally been a subset of administrative services. The move is now in the other direction. One manager of IS in a large insurance firm is quite candid about his objective here: "I want to get full control over administrative services, because by 1990 the main evaluation criteria for my group's performance will depend on trivial details that they now handle."

The triumph of technology over time



Universal Data Systems

POWER
L DOPBACK K RMT ALOG
NORMAL
ANALOG
DIGITAL
RMT DIGITAL
RMT ALOG

TST PTRN
TSTOP
FB TST RTS CTS TD QM CD RD/ERR
INIT NET

9600FP



UDS 9600 Fastpoll cuts on-line training time 33%

Training time — it's probably the biggest deterrent to truly efficient throughput on any high-speed, dedicated data link.

The UDS 9600FP has cut on-line training time to 8 milliseconds, which is a 33% reduction of the previous 12 ms "industry standard." The result is a marked improvement in productive throughput and data link cost-effectiveness.

The device operates over unconditioned four-wire leased lines. In addition to its fastpoll capabilities, it can also function in the conventional CCITT V.29 mode. Integral test features allow for system performance evaluation and fault isolation within the communications link.

By incorporating LSI and microprocessor technologies, the UDS design also achieves size and power consumption advantages. For detailed specifications, contact Universal Data Systems, 5000 Bradford Drive, Huntsville, AL 35805. Phone 205/721-8000; Telex 752602 UDS HTV.

NEW



Universal Data Systems



MOTOROLA INC.
Information Systems Group

UDS modems are offered nationally by leading distributors. Call the nearest UDS office for distributor listings in your area.
DISTRICT OFFICES: Apple Valley, MN, 612/432-2344 • Atlanta, GA, 404/998-2715 • Aurora, CO, 303/368-9000 • Blue Bell, PA, 215/643-2336 • Boston, MA, 617/875-8868 • Columbus, OH, 614/895-3025 • East Brunswick, NJ, 201/238-1515 • Glenview, IL, 312/998-8180 • Houston, TX, 713/988-5506 • Huntsville, AL, 205/721-8000 • Issaquah, WA, 206/392-9600 • Livonia, MI, 313/522-4750 • Mesa, AZ, 602/820-6611 • Milwaukee, WI, 414/273-8743 • Mission Viejo, CA, 714/770-4555 • Mountain View, CA, 415/969-3323 • Richardson, TX, 214/680-0002 • St. Louis, MO, 314/434-4919 • Silver Spring, MD, 301/942-8558 • Tampa, FL, 813/684-0615 • Uniondale, NY, 516/222-0918 • Van Nuys, CA, 818/891-3282 • Willowdale, Ont, Can, 416/495-0008

Created by Dayner/Hall, Inc., Winter Park, Florida

MANAGEMENT



TAKING CHARGE

Mitch Betts
and David A. Ludlum

Pregnancy and VDTs

If you thought the study of the effects of VDTs on pregnant women by the National Institute for Occupational Safety and Health (NIOSH) would be the end-all of VDT studies, take a closer look.

The study will focus on whether VDTs cause miscarriages and birth defects among women who use them. But in approving money for the study, the White House Office of Management and Budget (OMB) ordered the deletion of questions about whether VDTs might cause stress, a key issue considering the pace of much data entry work.

NIOSH plans to study the pregnancies of 2,000 telephone directory assistance operators who use VDTs at Bell South Corp. and compare them with those of 2,000 AT&T operators who do not use VDTs [CW, Jan. 14, 1985].

In an interview earlier this month, Teresa Schnorr, an epidemiologist who is directing the study, described the deleted portions as "critical." These portions would have investigated concerns that VDTs might affect a woman's ability to conceive or may cause miscarriages that occur so early in a pregnancy that they are not noticed. Bell South opposed those portions of the study in a critique submitted to NIOSH and the OMB, Schnorr said.

Many observers had hoped the NIOSH study would end the debate over clusters of miscarriages and birth defects reported by women using VDTs. Last year, a report by the U.S. House of

See PREGNANCY page 70

Betts is Computerworld's Washington, D.C., correspondent, and Ludlum is senior editor, management.

U.S. West boosts OA links

Holding company seeks postdivestiture solution

By David A. Ludlum

DENVER — U.S. West, the regional telephone holding company for 14 western states, has embarked on a program of integrating a slew of disparate computer systems in an effort to improve internal communications and reduce costly use of paper.

The job entails linking office automation hardware and software from IBM and Wang Laboratories, Inc., as well as machines from Digital Equipment Corp. and Unix systems running on boxes from several other vendors.

The effort stems from a corporate drive to improve communications by allowing users of the incompatible equipment that has been installed over the years to talk to each other and receive memos via electronic mail.

The unification of the systems by U.S. West, which operates Mountain Bell, Pacific Northwest Bell and Northwestern Bell, is in part a response to organizational realities generated by the breakup of the



Paul Malkoski

Bell system.

"Since divestiture, we've been taking a more universal approach to problem solving, particularly in office automation," said Paul Malkoski, an assistant staff manager with Mountain Bell's Business Information Services department.

As a by-product of improving communications, the company aims to stem the tide of paper streaming through its offices by 25% this year. It estimates usage of 35.8 million pieces of paper a year at a cost of \$45.8 million, a volume it attributes in part to the dictates of regulation and divestiture.

Half of the paper reduction is to come from the expansion of electronic mail, which emphasizes broadcasting memos as well as transmitting messages among individuals. Memos are being distributed through electronic bulletin boards and document data bases, Malkoski said.

The other half of the reduction is to come through new record management systems, including a computer-assisted retrieval system from Eastman Kodak Co., and through changing workers' attitudes toward the use of paper.

Separately, U.S. West's Human Resources

See U.S. page 69

INSIDE

Calendar: Shows, conferences, seminars / 72

INSTANT ANALYSIS

"You see the information center positioning itself as an information broker, and that's a very powerful position."

— Eric Greenberg,
director of surveys
for the American
Management
Association

Expos bring technology in-house

By David A. Ludlum

Pressed for time and faced with a steady barrage of computer product announcements, some information systems managers have taken vendors by the horns by inviting them to in-house miniature exhibitions.

Such an event, called a technology day by some, is one of a variety of methods that information systems managers use to keep up with rapid-fire technological change while attending to their other myriad duties.

"The problem is keeping abreast of technology," says Ronald Price, information systems operations manager at Polaroid Corp. of Cambridge, Mass. "Technology day came about as a result of vendors coming in with different products and new releases. I said, 'Gee, this is crazy.'"

At the Gillette Co. of Boston, where similar events are held, manager of office systems Joseph J. Calabresi says he started holding technology days for a selfish reason: "I just haven't the time anymore."

The idea is "to get problems and solutions together," Calabresi says.

By inviting the office systems vendors around which Polaroid has standardized — Wang Laboratories, Inc., Digital Equipment Corp. and IBM — the camera company

See EXPOS page 69

MANAGEMENT MEMO

Strategies: Hyatt tests terminals; firms employ ergonomics

Hyatt Corp. is experimenting with using information technology to enhance accommodations at its Hyatt Regency Hotel in Cambridge, Mass. The hotel installed terminals for an in-house videotex system in deluxe rooms on a floor for business travelers and outside elevators on other floors.

The system, developed by Cambridge Technology Center, Inc. (CTC), uses AT&T 3B computers and 510 terminals and a telephone with touch-screen dialing. It offers information on hotel facilities and local dining and entertainment.

After a two-month trial, CTC removed the system to improve the software. The terminal was not de-

signed for public use, which caused some users to lose their way, said CTC President Howard Kolodny.

CTC is developing a new read-only memory and expects the system to be back in service in "a month or so," Kolodny said. In the future, it might access external information such as stock quotes, news and flight information, he added.

Feedback from Hyatt guests has been wonderful, said Susan Conway, the hotel's director of sales. Other hotels have expressed interest in the system, and CTC is negotiating an agreement regarding it with AT&T, Kolodny said. He added that the system may be appropriate for other settings such as corporate visitor

centers and office building lobbies.

U.S. West, the regional telephone holding company for 14 states (see story this page), may try to capitalize on its experience with information technology to go into a new line of business — trading securities.

The Denver-based company has filed waivers with the U.S. Department of Justice seeking permission to enter the securities business as well as the consumer electronics business, with a focus on computers.

U.S. West's knowledge of communications is a factor in its interest in securities, said Don Johnson, the company's director of public information. "We certainly know the

business of information distribution. Our experience would serve us well if we chose to get into that area," he said.

But filing the waiver "doesn't necessarily mean we will," Johnson said. The company wants to be prepared if it decides to go ahead. He confirmed that it is "certainly not afraid" to acquire another company to go into the securities business.

Ergonomic features for VDTs are provided by about three-fourths of the companies that responded to a member survey by the Data Processing Management Association.

Among the most common features See MEMO page 70

NonStop VLX.

Tandem technology sets the new standard for large applications in on-line transaction processing.

More transactions per second at a lower cost per transaction than any system in the world.

THE CIRCUITRY'S FAST.

We designed the system in our own laboratory, right down to our own unique VLSI chips. The result is more circuitry in less space. With fewer components than our next largest system, the VLX delivers twice the performance and three times the reliability.



PROCESSORS WITH LARGE APPETITES.

The VLX processors move transactions in 32-bit chunks. They reach into main memory in 64-bit chunks. Because this happens in parallel, more work gets done in less time at a lower cost per transaction.

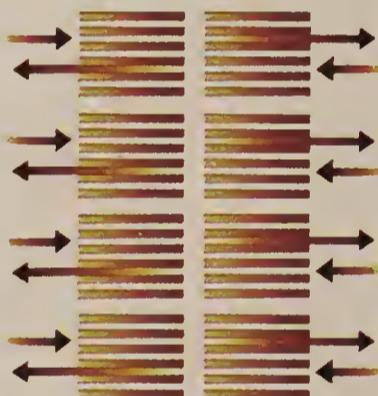
THE SERVICE IS EASY.

All critical components are field replaceable. When service is required, it's faster. You don't even have to stop an operation to add or replace components.



THE DATA EXPRESSWAY.

In a conventional database, I/O requests must be handled sequentially. This creates queues that slow response time. In the VLX system, there are multiple paths to multiple disks. Data enters and leaves the database simultaneously. No time is wasted, and all disk space gets used.

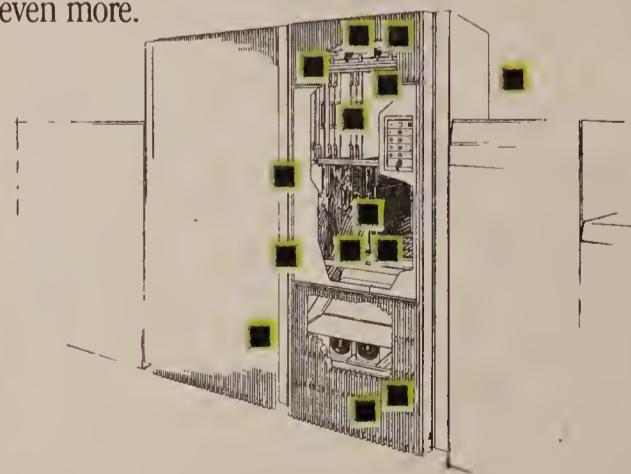


DIAGNOSTICS FROM A DISTANCE.

An integrated microprocessor allows us to monitor the system environment from anywhere in the world. We can even run stress tests remotely. If a failure does occur, the VLX has the capability to automatically dial out to remote centers anywhere in our worldwide network.

THE SYSTEM KNOWS THE SYMPTOMS.

Expert systems software, using fault analysis, directs the problem diagnosis systematically. It also allows us to analyze it and shorten service time even more.

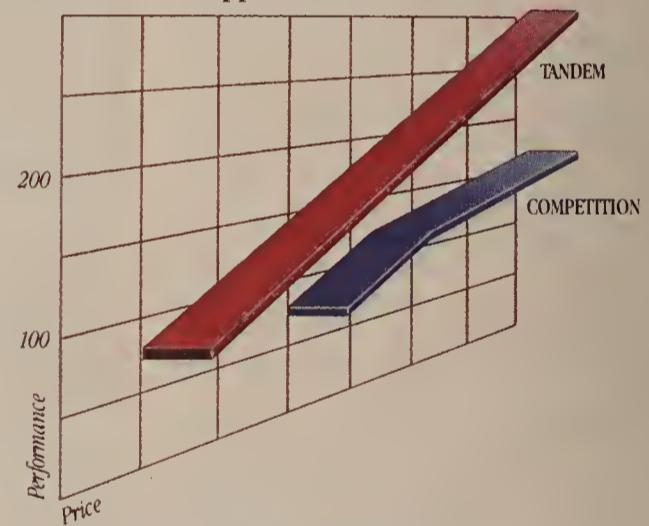


SECRETS ARE SAFE.

We offer software that will protect the security of your data whether it's in the VLX, in another Tandem system or in transmission.

NO GROWING PAINS.

To add power, just add processors. You can grow from a base four-processor system to 16. From there, you can expand in whatever increments you choose, all the way to 255 systems. You never buy more than you need, and you'll never have to rewrite a line of applications code.



NO-FAULT INSURANCE.

Tandem systems achieve fault-tolerance with a unique, parallel processing architecture. There are no idle back-up components. Instead, multiple components share the workload. If one goes down, the others pick up the slack, and application processing is uninterrupted.

HERE TODAY. HERE TOMORROW.

The VLX is compatible with any Tandem system and with all major communications standards—SNA, X.25, MAP and O.S.I. And by acting as a gateway to other vendors' systems, the VLX can link them and enhance their value as well.

WE HAVE EXCELLENT REFERENCES.

Tandem systems are already at work for Fortune 500 companies in banking, telecommunications, manufacturing, transportation, retailing and energy, as well as several branches of the U.S. Government.

To find out what we can do for you, call 800-482-6336 or write to us. Corporate Headquarters: Tandem Computers, Incorporated, 19191 Vallco Parkway, Loc. 4-31, Cupertino, CA 95014

 **TANDEM COMPUTERS**

MANAGEMENT

U.S. West boosts OA links

From page 67

sources department is experimenting with telecommuting, observing about 100 employees in the Denver and Phoenix areas who are doing most of their work from home. An official of the department declined to elaborate on the experiment.

U.S. West's office automation systems include about 15 multinode local networks that serve roughly 20,000 terminals operating from about 150 host computers. There are 14,000 electronic mail users.

The company recently consolidated its Denver-area operations through construction of a new headquarters building, a move it used to kick off its integration effort by installing a broadband, coaxial cable network.

"It pointed the way to what we wanted to get," which was a vast wide-area net linking U.S. West computers in an area from the state of

Washington to Arizona, Colorado and Minnesota and in offices in Washington, D.C., Malkoski noted.

The Denver-area network, which U.S. West built in-house, links 7,500 terminals and computers from seven vendors, both in the new building and others within a seven-mile radius. It includes switches that allow reconfigurations without moving lines and voice cables that run alongside data lines.

The network ties together the three predominant office automation and operating system environments at U.S. West — IBM Professional Office Systems (Profs) operating on VM, Wang Office running on VS and AT&T Unix System V operating on several brands of hardware.

U.S. West is "going to put less emphasis" on another environment — DEC's All-In-1 operating on VAX/

VMS. It has relatively few of the systems and wants to avoid the aggravation of building specific gateways for them, Malkoski said. It will continue to use the DEC computers, porting Unix office automation systems to them.

"It's not that we don't think DEC is a good and valued vendor," Malkoski said. "We are removing All-In-1 from the picture, not DEC. It's more a tactical decision than anything else."

In building its wide-area network, the company is integrating the systems within each environment before attempting to tie them together. Integration of individual environments should be finished during the last quarter of this year, Malkoski claimed. The bridges between environments are expected to be done by the first quarter of next year.

U.S. West required each network

to have a standard directory of electronic addresses, a file transfer format, directory updating and consistent software revision. The single biggest technical challenge has been integrating the user directory systems, Malkoski noted.

One hurdle has been resistance from vendors that are not eager to help U.S. West use other vendors' products, he said. "In some ways we're at the mercy of some vendors. They're protecting their own turf. IBM doesn't want to tell you how to integrate Profs into Wang Office because they want to sell you more Profs," Malkoski said.

In the future, U.S. West will standardize purchases of office automation equipment around the three environments, selecting the one that offers the best solution for the problem at hand, Malkoski said.

"Computerworld tops its MIS/DP competition hands down. And it doesn't stop there."

Nora Feldman Glidea
Director of Marketing
IDEAssociates, Inc.
Billerica, MA



IDEAssociates, developer and marketer of IBM PC peripherals and a company with 500% growth during its last fiscal year, first started using Computerworld to reach a selected audience (MIS/DP) with a narrow segment of their product line (LANs and micro-to-mainframe and micro-to-mini communications links). But as the responses started coming in, Nora Feldman Glidea, Director of Marketing, found that Computerworld attracted much more than just MIS/DP professionals.

"We immediately increased our advertising to include our full product line — boards, mo-

dems, graphics, mass storage, networks — everything. The responses are coming from Computerworld readers in all six of our audiences: the PC end user, the business manager, the retailer, the OEM and VAR side of the market, and, of course, the MIS/DP executive."

"Each time we summarized our lead tracking system, Computerworld kept coming out on top in the MIS/DP market. In the 800 response, it tallied the most calls. And on our warranty cards in an unadded readership question, Computerworld was mentioned most often."

As Nora confirms, "The numbers are in. Computerworld

tops its MIS/DP competition hands down."

Computerworld. We help more suppliers reach more buyers, more often in the computer marketplace. We cover the entire computer world. Every week. We're working for IDEAssociates. We can work for you, too.

Call your Computerworld representative for all the facts. Or call Ed Marecki, Vice President/Sales, at (617) 879-0700.

IDEAssociates is a registered trademark of IDEAssociates, Inc. IBM is a registered trademark of International Business Machines Corporation.

BOSTON/(617) 879-0700. NEW YORK/(201)
967-1350. CHICAGO/(312) 827-4433.
ATLANTA/(404) 394-0758. DALLAS/(214)
991-8366. LOS ANGELES/(714) 261-1230.
SAN FRANCISCO/(415) 421-7330.

A PUBLICATION OF
CW COMMUNICATIONS



MANAGEMENT

Pregnancy and VDTs

From page 67

Representatives' Subcommittee on Health and Safety [CW, Sept. 16] called the NIOSH study vital and said its results could have far-reaching effects in reducing the fears of pregnant women using VDTs.

At recent House hearings, the Communications Workers of America (CWA) denounced the OMB action, charging it damages the credibility of the study.

The OMB, which controls government studies involving questionnaires under the Paperwork Reduction Act of 1980, initially rejected the NIOSH study proposal on

grounds that it contained technical design flaws [CW, Feb. 24].

NIOSH resubmitted the proposal, and the OMB gave it conditional approval.

A June 6 letter by James B. MacRae Jr., chief of the OMB's reports management branch, said the questions on stress and other topics should be deleted because there was insufficient evidence linking them to reproductive problems. "They [the questions] therefore have no practical utility. In addition, they impose unnecessary burdens on respondents, and would add to the costs of conducting the study and data analysis," the letter said. MacRae also objected to questions about fertility, stating that measuring the effect of VDT exposure on fertility is not the purpose of the study.

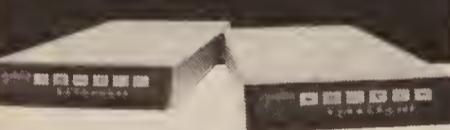
Critics say the OMB made the changes at the behest of Bell South, which is concerned that it may be singled out for adverse publicity, but the OMB has denied the charge.

The CWA protested that the OMB's criticisms were strikingly similar to those of Bell South. David E. LeGrande, the union's director of safety and health, said he believes the OMB "basically was told what direction to take by Bell South and then used its letterhead to sign onto it."

"

The OMB initially rejected the NIOSH study proposal on grounds that it contained technical design flaws.

Foolproof data communications



When you need data security, AJ has the solution.

AJ's new 1200 and 2400 bps modems give you the foolproof security feature—callback.

The AJ 1212-AD3H and AJ 2412-AD3H offer callback security. After a caller enters a correct code sequence to log onto the modem, the modem drops the line and calls back one of 25 designated numbers stored in nonvolatile memory. These new modems stop intruders before they get to your computer!

Both modems are Hayes "AT" compatible, provide a full featured memory dialer, and include other security features—answerback, two-level password protection, selective number display, downline loading, and automatic logon.

And the new AJ Data-Safe system offers the ultimate security feature—DES encryption.

Send the coupon for details.

A ANDERSON JACOBSON

Please send FREE information on the following:

- AJ 1212-AD3H (1200 bps)
- AJ 2412-AD3H (2400 bps)
- AJ Data-Safe (DES encryption)

Name _____

Title _____

Company _____

Address _____

City/State/Zip _____

Phone (_____) _____

Anderson Jacobson, Inc., 521 Charcot Avenue, San Jose, California 95131, (408) 435-8520.

MANAGEMENT MEMO

MEMO from page 67

are detachable keyboards, used by 81% of the respondents; adjustable backrests on chairs, used by 71%; adjustable-height chairs, used by 78%; and swiveling monitors, 65%.

Managers who were surveyed also said they pay attention to vision problems, with 61% claiming to use glare-reducing filters for screens.

Slightly more than half put blinds or shades on windows near VDTs, and 88% buy terminals with brightness controls. But only 18% provide lighting for documents.

The survey shows that fewer than half the companies consult workers on implementing new technology or on revising work routines because of new technology — 40% and 48%, respectively.

Participative management is on the decline in data entry, while job rotation has become more popular, according to a recent survey by the Data Entry Management Association of Stamford, Conn.

The number of member organizations with participative management declined to 24% from 37.5% last year, according to the survey. In 1984 the portion was 35%, and in 1983 it was 43%.

Meanwhile, the portion of respondents with job rotation programs grew to 70% from 63% last year.

The driving forces behind most data processing professionals' careers are challenge or self-esteem, according to another survey by the Data Processing Management Association.

The survey reported 36% of respondents are motivated by challenge and 33% by self-esteem. Salary and career enhancement were each cited by 15%.

The survey found that U.S. information executives earn an average of \$42,760 per year and that 59% feel they are "sufficiently paid" compared with managers who have similar responsibilities in other fields.

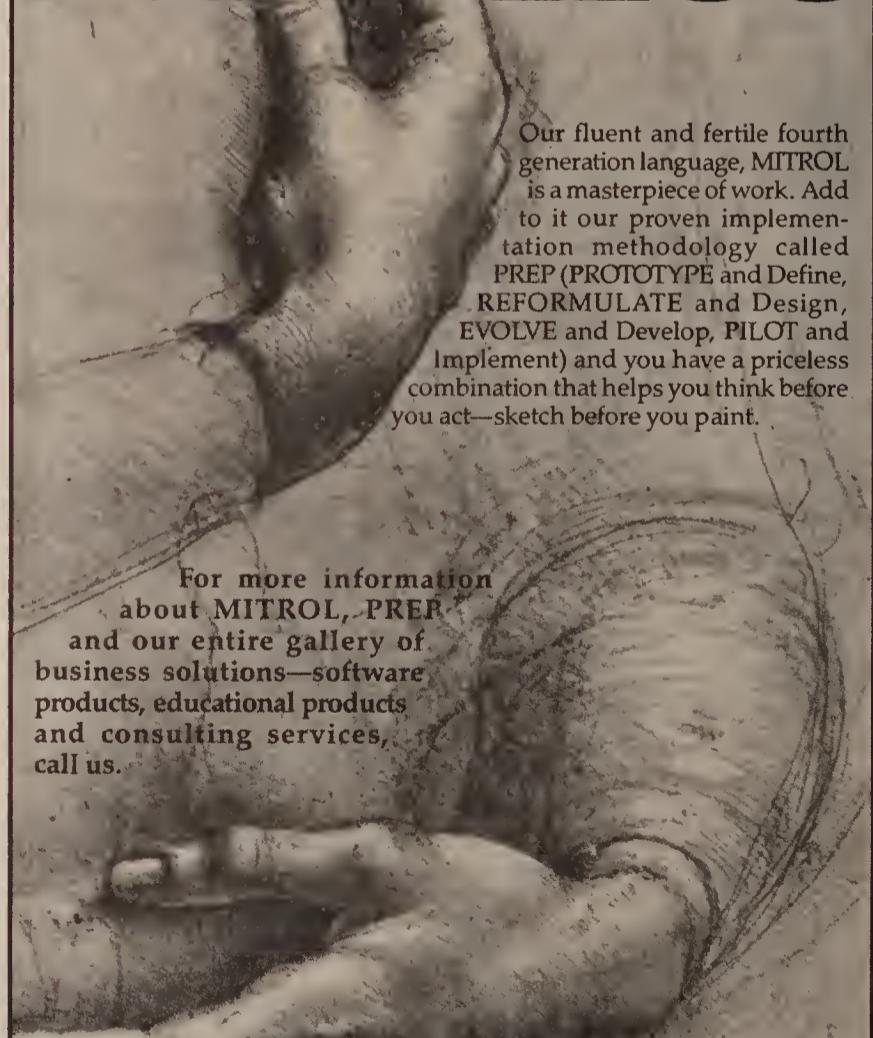
Executives waste 7.4% of their time looking for things that have been misplaced, according to an independent survey of vice-presidents and personnel directors sponsored by Accountemps of New York.

Based on a 40-hour week, that figure adds up to three hours a week and four workweeks a year of lost time, the firm said. Respondents were from the 1,000 largest U.S. corporations.

Perhaps that helps account for the heavy work load top executives take home. A similar study for Accountemps' parent firm, Robert Half International, Inc. of Jericho, N.Y., put the load at 10.5 hours a week.

— David Ludlum

PRICELESS



For more information about MITROL, PREP and our entire gallery of business solutions—software products, educational products and consulting services, call us.

Our fluent and fertile fourth generation language, MITROL is a masterpiece of work. Add to it our proven implementation methodology called PREP (PROTOTYPE and Define, REFORMULATE and Design, EVOLVE and Develop, PILOT and Implement) and you have a priceless combination that helps you think before you act—sketch before you paint.

Mitrol.

The Fine Art of Information Management.

Mitrol Inc., World Headquarters, 800 Cummings Pk, Woburn, MA 01801 (617) 933-9545

Mitrol Incorporated in partnership with Teamco Systems Innovation headquartered in Holland 31.3465.71544



A network is not a network if it's not working.

Your data communications network is the lifeline of your business, a vital corporate asset. And keeping it that way is your responsibility.

Maximizing network uptime is where Codex earns its reputation. It's also how you can protect yours. Bring a Codex network management system on board, and you have the most powerful diagnostic tool for identifying and solving network problems

before they affect network service. You get more information, present it better and faster and use it more effectively and efficiently, and can even produce customized reports and logs for analysis and future high-level decision making.

A 32-bit minicomputer provides optimum system capacity for true "end-to-end" network management, so without missing a beat you can continuously monitor up to 25 different network parameters, support up to ten control terminals at once, address up to sixteen segments per line, and manage up to 6,000 devices from one or more sites.

Codex 4800 Series network management systems are now available with low-, mid-, and high-range models structured to meet your needs today and grow with you into the future.

For more information about the Codex 4800 Series, call 1-800-426-1212, ext. 284. Or write Codex Corporation, Dept. 707-84, 20 Cabot Boulevard, Mansfield, MA 02048.



codex
MOTOROLA

Visit the Codex booth at TCA (September 23-25); CMA (October 8-10); and Info (October 6-9).

© Copyright 1986 Codex Corporation. Motorola and M are trademarks of Motorola, Inc. Codex is a registered trademark of Codex Corporation.

MANAGEMENT



CALENDAR

AUGUST 24-30

The Third International Congress on Advances in Non-Impact Printing Technologies. San Francisco, Aug. 24-28 — Contact: Society of Photographic Scientists and Engineers, 7003 Kilworth Lane, Springfield, Va. 22151.

Fault Tolerant Computing. Santa Cruz, Calif., Aug. 25-29 — Contact: Karin Poklen, Institute in Computer Science, University of California Extension, Santa Cruz, Calif. 95064.

Interconnect '86. San Mateo, Calif., Aug. 26-28 — Contact: Agnes M. Pavel, Program Director, U.S. Telecommunications Suppliers Association, Suite 1618, 333 N. Michigan Ave., Chicago, Ill. 60601.

Information Systems Assessment. Noordwijkerhout, the Netherlands, Aug. 27-29 — Contact: Stichting Informatica Congressen, Paulus Potterstraat 40, 1071 DB Amsterdam, the Netherlands.

AUG. 31-SEPT. 6

International Federation for Information Processing Congress '86. Dublin, Sept. 1-5 — Contact: International Federation for Information Processing Congress '86, 44 Northumberland Road, Dublin 4, Ireland.

Fourth Annual Office Automation Society International Conference. Chicago, Sept. 2-6 — Contact: Sue Pickard, OASI, Suite B, 15269 Mimosa Trail, Dumfries, Va. 22026.

The Desktop Publishing Conference. San Francisco, Sept. 3-6 — Contact: Seybold Seminars, 6922 Wildfire Road, Malibu, Calif. 90265.

Project Management Systems. Minneapolis, Sept. 3-5 — Contact: The American Institute, Carnegie Building, 55 Main St., Madison, N.J. 07940. Also being held Sept. 22-24 in Boston, Sept. 29 to Oct. 1 in Philadelphia and Oct. 22-24 in Cincinnati.

Federal Computer Conference. Washington, D.C., Sept. 3-5 — Contact: Ben Hughes, Federal Computer Conference, Box N, Wayland, Mass. 01778.

Telemarketing/West. Los Angeles, Sept. 3-5 — Contact: Doug Shreve, The Telemarketing Foundation, Inc., P.O. Box 829, Arnold, Md. 21012.

National Canadian Systems 3X Users Show. Toronto, Sept. 4-5 — Contact: Elodia Thomas, c/o The Producers, 360 Merrimack St., Lawrence, Mass. 01843.

SEPTEMBER 7-13

1986 Electronic Printer Conference. Boston, Sept. 7-10 — Contact: Jean O'Toole, CAP International, Inc., One Snow Road, Marshfield, Mass. 02050.

System 1022/1032 Users Conference. Burlington, Mass., Sept. 7-10 — Contact: System 1022/1032 Users Group, c/o Software House, 1000 Massachusetts Ave., Cambridge, Mass. 02138.

Planning for Network Integration. Nashville, Sept. 7-10 — Contact: Southeastern Telecommunica-

tion Association, P.O. Box 901, Richmond, Va. 23207.

How to Design and Implement Bar Code Systems. Detroit, Sept. 8-9 — Contact: Nancy Loerch, Society of Manufacturing Engineers, P.O. Box 930, One SME Drive, Dearborn, Mich. 48121.

Tutorial Week Boston '86. Cambridge, Mass., Sept. 8-12 — Contact: Martez A. Camilleri, Director of Tutorials, IEEE Computer Society, 1730 Massachusetts Ave., Washington, D.C. 20036.

Entity Modeling: Techniques and Application. Washington, D.C., Sept. 8-10 — Contact: Barnett Data Systems, 19 Orchard Way N., Rockville, Md. 20854.

Technical Update Conference — 86. Anaheim, Calif., Sept. 8-10 — Contact: Security Pacific Audit Services, Suite 208, 11565 Laurel Can-

yon Blvd., San Fernando, Calif. 91340.

NCC-Telecommunications Conference. Philadelphia, Sept. 8-10 — Contact: NCC-Telecommunications, American Federation of Information Processing Societies, 1899 Preston White Drive, Reston, Va. 22091.

Quality Assurance Institute's Seminars on Quality Data Processing. Toronto, Sept. 8-12 — Contact: QAI, 9222 Bay Point Drive, Orlando, Fla. 32819.

Writing Procedures, Policies and Documentation. Austin, Texas, Sept. 8-12 — Contact: Laurel Lewis, Information Mapping, Inc., 275 Wyman St., Waltham, Mass. 02154.

43rd FID Conference and Congress. Montreal, Sept. 8-18 — Contact: FID 43rd Conference and Congress, C.P. 1144, Succursale Place Desjardins, Montreal, Que., Canada

H5B 1B3.

National Capital Datapoint User Group Meeting. Arlington, Va., Sept. 9 — Contact: Margaret Valavanis, OSP/WHS/DCOAR, Room 1C730, The Pentagon, Washington, D.C. 20301.

Computing in the 21st Century. Bloomington, Minn., Sept. 9-10 — Contact: Charles Babbage Institute, University of Minnesota, 103 Walter Library, 117 Pleasant St. S.E., Minneapolis, Minn. 55455.

Satellite Communications Users Conference '86. Las Vegas, Sept. 9-11 — Contact: Satellite Communications, 6530 S. Yosemite St., Englewood, Colo. 80111.

Midecon/86. Dallas, Sept. 9-11 — Contact: Midcor 8110 Airport Blvd., Los Angeles, Calif. 90045.

1986 Intelligent Buildings Conference and Exposition. Atlanta, Sept. 9-11 — Contact: Bryson Asso-

BEST

BEST

BEST



COMPAQ® Portable

The world's first full-function portable personal computer

The best-selling portable in the world



COMPAQ PLUS®

The world's best-selling high-capacity portable PC

Voted Favorite Product in its category by readers of PC World



COMPAQ DESKPRO®

Offers more performance than any other basic desktop in its class

Highest rated in its category by Software Digest

MANAGEMENT

ciates, 162 Tower Place, 3340 Peachtree Road N.E., Atlanta, Ga. 30026.

Corporate Electronic Publishing Systems IV: A Conference and Show. Boston, Sept. 9-11 — Contact: Cahners Exposition Group, 999 Summer St., Stamford, Conn. 06905.

Real-Time Operating Systems: A Hands-On Workshop. San Diego, Sept. 9-12 — Contact: Yolande Amundson, Integrated Computer Systems, P.O. Box 3614, 5800 Hannum Ave., Culver City, Calif. 90231. Also being held Oct. 28-31 in Boston and Nov. 11-14 in Palo Alto, Calif.

Second European Simulation Congress. Antwerp, Belgium, Sept. 9-12 — Contact: The Society for Computer Simulation, c/o Ghislain C. Vansteenkiste, University of Ghent, Coupure Links 653, B-9000 Ghent, Belgium.

Southwest Idaho Chapter of the

Data Processing Management Association's Annual Computer Show. Boise, Idaho, Sept. 10-11 — Contact: Jerry Morelan, Publicity Chairman, Southwest Idaho Chapter of the Data Processing Management Association, Boise State University, College of Business, 1910 University Drive, Boise, Idaho 83725.

Devlin Associates, Inc. Tenth Annual Disaster Recovery Planning Conference. Atlantic City, Sept. 10-12 — Contact: Devlin Associates, 430 Exton Commons, Exton, Pa. 19341.

Token-Ring Network & Application Program Interfaces. Palo Alto, Calif., Sept. 11-12 — Contact: Token-Ring Network & Application Program Interfaces Seminars, Communications Solutions, Inc., 992 S. Saratoga-Sunnyvale Road, San Jose, Calif. 95129. Also being held Sept. 25-26 in New York.

Dataquest, Inc. Conference. San Diego, Sept. 11-12 — Contact: Computer Storage Industry Service, Dataquest, 1290 Ridder Park Drive, San Jose, Calif. 95131.

Optical Storage and Retrieval. Hyannis, Mass., Sept. 11-12 — Contact: International Optical Telecommunications, 720 Main St., Hyannis, Mass. 02601.

SEPTEMBER 14-20

CADRE — An Applied Data Research Users Conference. Nashville, Sept. 14-18 — Contact: Allen Haggard, Director of Client Relations, Applied Data Research, Rt. 206 and Orchard Road, CN-8, Princeton, N.J. 08540.

Bypass: The Second Wave. New York, Sept. 16 — Contact: Jon Boroshok, Conference Registrar, The

Eastern Management Group, Four Century Drive, Parsippany, N.J. 07054.

Canadian Office Machine Dealers Association/Candex. Montreal, Sept. 18-19 — Contact: Roy Whitsed, Candex Conference, Inc., 47 Lakeshore Road E., Mississauga, Ont., Canada L5G 4L7.

SEPTEMBER 21-27

National Retail Merchants Association's 28th Annual Retail Information Systems Conference. Anaheim, Calif., Sept. 21-24 — Contact: J. Joseph Miller, Director of Retail Standards and Technology, National Retail Merchants Association, 100 W. 31 St., New York, N.Y. 10001.

PSMJ CADD Managers Roundtable. Hyannis, Mass., Sept. 21-26 — Contact: Anita Stasiowski, PSMJ Roundtables, 10 Midland Ave., Newton, Mass. 02158.

Eighth Annual Lasers in Graphics/Electronic Publishing in the 80's Conference. Anaheim, Calif., Sept. 21-29 — Contact: Lasers in Graphics, Suite 1, 1855 E. Vista Way, Vista, Calif. 92084.

"C" Programming with Style and Discipline. Milwaukee, Sept. 22-24 — Contact: John T. Snedeker, Center for Continuing Engineering Education, College of Engineering & Applied Science, University of Wisconsin — Milwaukee, 929 N. Sixth St., Milwaukee, Wis. 53203.

Space Tech '86. Orlando, Fla., Sept. 22-25 — Contact: Society of Manufacturing Engineers Public Relations, Box 930, One SME Drive, Dearborn, Mich. 48121.

Lasers in Automotive Manufacturing. Detroit, Sept. 23-24 — Contact: Mary Dombrowski, Society of Manufacturing Engineers, P.O. Box 930, One SME Drive, Dearborn, Mich. 48121.

International Videotex Industry Exposition and Conference. New York, Sept. 23-25 — Contact: Susan LeDonne, Cahners Exposition Group, P.O. Box 3833, Cahners Plaza, 999 Summer St., Stamford, Conn. 06905.

Computer Aided Publishing '86 Exposition and Conference. Washington, D.C., Sept. 23-25 — Contact: Computer Aided Publishing Association, Suite 200, 90 W. Montgomery Ave., Rockville, Md. 20850.

Artificial Intelligence and Advanced Computer Technology Conference/Exhibition. Wiesbaden, West Germany, Sept. 23-25 — Contact: Tower Conference Management Co., 331 W. Wesley St., Wheaton, Ill. 60187.

EDI Training Session. Arlington, Va., Sept. 25-26 — Contact: TDCC, 1101 17th St. N.W., Washington, D.C. 20036.

The Fourth Annual NCR Users Eastern America Conference. Atlantic City, Sept. 25-26 — Contact: Jack Hibberd, ECUO Treasurer/Convention Publicity Chairman, c/o AOR, Inc., P.O. Box 429, Willow Grove, Pa. 19090.

Robot Applications for Automotive Manufacturing. Detroit, Sept. 25-26 — Contact: Mary Dombrowski, Society of Manufacturing Engineers, P.O. Box 930, One SME Drive, Dearborn, Mich. 48121.

The Association for Women in Computing's Fifth Annual Conference. St. Louis, Sept. 26-28 — Contact: Association for Women in Computing Conference '86, 407 Hillmoor Drive, Silver Spring, Md. 20901.

BEST

BEST

NOT BAD



COMPAQ PORTABLE 286®

*The most powerful portable on the market
Received the "Top Transportable of 1985"
World Class PC Award from PC World*



COMPAQ DESKPRO 286®

*Unsurpassed speed, storage, memory
Awarded Software Digest's highest
overall performance score for 1986*



COMPAQ PORTABLE II™

*Best-selling 80286 portable in the world
30% smaller, 17% lighter, 400% faster
than original COMPAQ Portable*

Each and every personal computer COMPAQ makes is tops in its class. Not bad considering COMPAQ makes the broadest line of business PC's in the industry. And quite astonishing when you consider that our latest, the COMPAQ PORTABLE II, became the worldwide best-seller in its category in a record four months. But then, that's typical of COMPAQ.

Whatever your need, we make the very best PC to meet it. With quality, speed, power, expandability, ruggedness, and compatibility that have become legendary. With innovations like internal tape back-up and monitors that display high-resolution text and graphics.

In short, COMPAQ offers you everything but compromises. That's why our products consistently earn the highest ratings from industry experts and users alike. Which in turn is why we reached the Fortune 500 faster than any other company in history.

For a free brochure or the location of your nearest Authorized COMPAQ Computer Dealer, call 1-800-231-0900 and ask for operator 21. In Canada, call (416) 449-8741.

©1986 COMPAQ Computer Corporation.
All rights reserved.

COMPAQ®

TYMNET MAKES YOUR IBM EQUIPMENT WORK SMARTER.

Tymnet's Services for use with IBM® systems are a full array of value-added solutions for your wide-area IBM data communications requirements. These, of course, begin with X.25 capabilities. We helped create X.25. And we still lead the field.

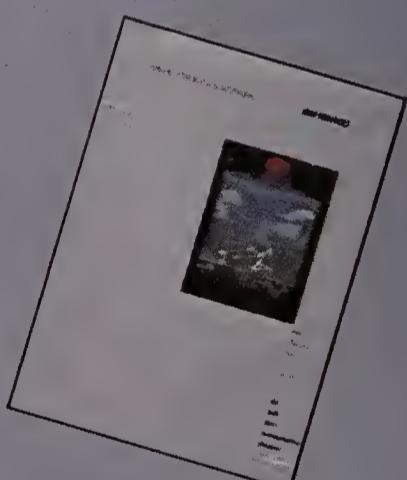
Tymnet also makes your IBM equipment work smarter with our unique Async-To-3270 protocol conversion service—the only network-resident service allowing inexpensive ASCII terminals and PCs to access IBM 3270 environments.

This integrated solution means you don't have to purchase special hardware and software. And your users gain single-footprint access to both IBM 3270 and async hosts.

What's more, you get support for both 3270 Bisync and SNA/SDLC protocols and inexpensive ASCII printers. Plus call access to the TYMNET network at 1200 or 2400 bps.

Tymnet's Services do more than make the async-to-3270 connection. We also offer communications services for synchronous terminal devices like 3270s, 3770s, 5250s, and 2780/3780 HASP devices. Better still, Tymnet manages everything for you.

Our Services are currently hard at work for more than 200 major companies using IBM systems. To find out how you can make your IBM equipment work smarter, call or write for the Tymnet brochure describing services for use with IBM systems.



TYMNET
2710 Orchard Parkway
San Jose, CA 95134
(408) 942-5254 ext. 68

ONE COMPANY, MANY SOLUTIONS

TYMNET®

**MCDONNELL DOUGLAS
NETWORK SYSTEMS COMPANY**

NEW PRODUCTS

DEC Q-bus, Unibus get color images

Peritek Corp. of Oakland, Calif., has introduced its VCX-Q/U color graphics board for Digital Equipment Corp. computers.

The single board, which costs \$5,895, is reportedly able to create images 24 planes deep, with an independent alphanumeric overlay. The VCX-Q/U board can display any of 16 million different colors at any moment, giving the user immediate access to virtually all hues discernible to the human eye, according to Peritek.

VCX-Q/U is quad-height size, configurable for either DEC Q-bus or Unibus computers. Principal applications for the graphics board, according to a Peritek spokesman, include sophisticated imaging, process control, simulation and presentation graphics.

The graphics display is said to consist of 512 by 512 pixels, with the color of each pixel being determined by 8 bits each for red, green and blue. Each 8-bit set is generated by an independent frame buffer and look-up table, permitting maximum flexibility in color selection.

The independent memory-mapped alphanumeric overlay reportedly consists of 50 lines by 80 characters. With this, the user has a choice of 64 character colors and 64 background colors, all independent of the graphics colors. The character set is stored in random-access memory and is user-programmable. VCX-Q/U has two video controllers, one for graphics and one for alphanumerics, which permit each display to be operated independently.

The board comes with a composite sync input, which is said to accept an internal signal to synchronize the board's operation with peripheral equipment. A direct port, independent of the computer's bus, enables an external device to operate directly on the board's registers and memories, according to a Peritek spokesman.

Software available for the VCX-Q/U includes test routines, initialization routines and a micro-level subroutine library for C language and Fortran, the vendor stated.

V-Mail supervises messages

Brooktrout Technology, Inc. of Wellesley Hills, Mass., has unveiled its V-Mail 220 voice messaging system, which is priced at \$9,900 per unit and is said to be capable of handling up to 100 users.

The V-Mail 220, a computer-based unit connected to the user's telephone system, digitally records, stores and plays back voice messages. According to the vendor, the V-Mail 220 is accessible 24 hours a day from any telephone in the country to allow users to direct the unit to record, route and retrieve messages. This service is said to help eliminate "telephone tag," to ensure that messages are delivered accurately and to protect the privacy of messages.

V-Mail 220 reportedly allows the user to send the same message to a number of people simultaneously. The system also reminds the user of any messages, forwards messages to another telephone number at a user-determined time or to a third party and lets the user review, revise and edit phone messages before sending them. With V-Mail 220, users can also identify caller and time of message, review previously saved messages, send messages normally or flag messages for urgent delivery and check to see if previously sent messages have been received.

The system can be configured as an



Brooktrout's V-Mail 220

open system in which anyone can call in and leave private messages, or it can be used as a closed system in which use is restricted to assigned users.

The messaging system has four major components: a microcomputer, two speech I/O channels, a 20M-byte, 5½-in. Winchester disk drive and multitasking control software.

Each of the V-Mail 220's I/O channels handles one telephone line. The cards connect directly to an existing telephone system and can digitize and play speech, decode Touch-Tones and eliminate pauses. The system can store up to 1½ hours of messages and can be expanded to 3½ hours by adding another disk.

Genicom unveils Quiet printer

Genicom Corp. of Waynesboro, Va., has added the 3410 Quiet dot matrix printer to the company's 3000 family of printers.

The Genicom 3410 Quiet is said to feature multiple mode printing, high-duty cycle and a noise level of lower than 55db. The 3410 Quiet is priced at \$2,645.

According to a Genicom spokesman, the 3410 Quiet prints 400 char./sec. in draft mode and 120 char./sec. in near-letter quality mode. At 18 and 10 char./in., the 3410 Quiet prints 244 and 136 columns, respectively.

The printer reportedly works with all popular personal computers and comes with a Centronics Data Computer Corp. parallel and RS-232C serial ports. With standard IBM graphics protocol, the 3410

Quiet is said to print high-resolution, dot-addressable graphics up to 144 by 144 dot/in. According to Genicom, 16 national character sets and IBM character sets 1 and 2 are also standard.

Up to six copies of paper can be accommodated with a choice of either rear or bottom feeding. An adjustable six-pin push tractor plus upper friction pinch rollers are used when paper is fed through the back of the printer. Optional automatic sheet feeders and single or dual bins are available.

Genicom also offers the 3410 printer, an identical version of the 3410 Quiet, although it does not include the sound reduction package. The 3410 printer is priced at \$2,450.

Twenty Four Reasons Why More Than 350 CICS Users Have Chosen SYSM Electronic Mail Over The Competition!

- Excellent Customer Support
- Outstanding Price Performance
- Fully Menu Driven/On Line Help
- Filing Cabinets
- Calendaring
- Scheduling
- Electronic Forms
- Application Program Interface
- User Friendliness
- Carbon Copies
- New Messages Highlighted
- In/Out Basket Review
- Route To Groups or Individuals
- Transfer With Comments
- Postdated Messages
- CRT, Printer & TTY Support
- And Coming Soon — Telex And PC Interfaces
- MRO/ISC Links
- Tickler Files
- Notification To TSO Users
- Dynamic DASD Management
- Multiple CPU Support
- Pseudo Conversational
- Bulletin Boards
- DOS/VSE, VSI, MVS, CICS/VS

Convince Yourself SYSM is the Winner!

*Take Advantage of Our 30-Day Free Trial. Call Us Now At
(208) 377-0336 or Write To Us At:*



H&W COMPUTER SYSTEMS INTERNATIONAL
P.O. BOX 4785
Boise, Idaho 83711-4785



INSIDE

Software & Services/77

Microcomputers/78

Communications/80

Systems & Peripherals/81

Price Reductions/85

"The #1 place to recruit qualified computer professionals nationally is Computerworld."



*Robin Schwartz
Employment and
Employee Relations Manager
McCormack & Dodge
Natick, MA*

Robin Schwartz is Employment and Employee Relations Manager for McCormack & Dodge, a software company based in Natick, Massachusetts. She is responsible for recruiting people for the company's home office as well as its seven regional offices across the country. And earlier this year when Robin was looking for software applications sales and support people, she chose to run an ad in Computerworld.

"I had numerous openings for positions across the country. From a cost-efficiency standpoint, Computerworld seemed like the logical choice," says Robin. "But before finalizing my decision, I did a little investigating. I talked to our sales managers here at McCormack & Dodge — and they all agreed. The #1 place to recruit qualified computer professionals nationally is Computerworld. To keep in touch with what's going on in the industry, people have to read Computerworld," she explains.

McCormack & Dodge is enjoying national visibility as a result of the ad, but, more importantly, Robin is quite pleased with the responses. *"My people were right. We placed the ad in the beginning of the year and received tremendous response via our two-day hot line (800 number). And since we are still getting resumes, Computerworld obviously has a long life cycle through its pass-along circulation," she adds.*

"The quality of the responses has made our ad placement more than worthwhile," concludes Robin. "The professionals responding to our ad are experienced, not just job changers. We are getting in touch with just the people we need to reach." In fact, according to Robin, "Quite a few of the positions are already filled. Thanks to Computerworld!"

Computerworld. We're helping employers and top professionals get together in the computer community. Every week. Just ask Robin.

For all the facts, call Al DeMille, National Sales Manager, at (617) 879-0700.

COMPUTERWORLD

375 Cochituate Road, Box 9171,
Framingham, MA 01701-9171/(617) 879-0700

 A PUBLICATION OF
CW COMMUNICATIONS

NEW PRODUCTS/SOFTWARE & SERVICES

**SOFTWARE
& SERVICES****Applications packages**

Autodesk, Inc. has released **AutoCAD Version 2.5** for the IBM RT Personal Computer.

Version 2.5 of AutoCAD runs under AIX, IBM's enhanced Unix operating system. It will take advantage of the PC RT's unrestricted access to up to 4M bytes of random-access memory to offer fast regeneration for large drawings. Additionally, it will handle programs written in Autolisp, the interactive programming language written into AutoCAD.

AutoCAD 2.5 on the IBM RT PC is priced at \$2,750.

Autodesk, 2320 Marinship Way, Sausalito, Calif. 94965.

MCBA, Inc. has ported its accounting and distribution software packages to the AT&T 3B family of computers.

The software packages available include accounts payable, bill of material processor, customer order processing, payroll purchase order and receiving, master scheduling and material requirements planning, according to the vendor.

Features found in each package include an optional security system that provides access privileges for each user, the ability to use a variety of terminals and provisions that alert the user to and allow recovery from data file I/O errors.

Prices range from \$1,500 to \$3,000 for object code only and \$2,000 to \$6,000 for source code licenses.

MCBA, 425 W. Broadway, Glendale, Calif. 91204.

Cosmic has announced the availability of the **Plaid** computer-aided design (CAD) program.

Plaid is a three-dimensional CAD system for interactively constructing and displaying sets of complex geometric models. Polygons are constructed explicitly by coordinates or graphically with either terminal cross hairs or a digitizer. Solid models are constructed by combining or rotating the polygons. Users may view the assemblies from arbitrary viewpoints in both wire frame and hidden-line renderings, with or without perspective.

Plaid is written in Fortran 77 for use on Digital Equipment Corp.'s VAX VMS computer. A 10-year license costs \$6,000.

Cosmic, University of Georgia, Computer Services Annex, Athens, Ga. 30602.

Precision Visuals, Inc. has announced the **Picsure Plus** data display system.

Picsure Plus offers fast start-up for new and infrequent users, with on-line tutorials and instant Help. Users can produce line, pie and bar charts, data tables, scattergrams and illustrations with single-button responses to menu prompts.

Picsure Plus combines multiple images into a single chart and automatically sizes and positions text and sets margins. Additional features reportedly allow users to merge images created with other Precision products and keep track of saved charts and data.

Picsure Plus costs \$20,500 on a Digital Equipment Corp. VAX 8200 or VAX-11/780.

Precision Visuals, 6260 Lookout Road, Boulder, Colo. 80301.



HOW A MAJOR UTILITY MANAGES 5 MILLION POWER-HUNGRY CUSTOMERS.

Managers attended a power lunch to discuss how to become the best power and light company in the United States.

They needed to leverage management skills, improve forecasts, track energy consumption better, gauge actual costs of supplying power. And increase profits.

They turned to an organization-wide visual information system from ISSCO. It's so successful, managers now use it to monitor the entire operation.

Keeping current with the needs of five million power-hungry customers is just one solution out of hundreds associated with ISSCO.



call toll-free for a free report
on **Million Dollar Applications**. 1-800-556-1234,
ext. 530. In California
1-800-441-2345, ext. 530.



10505 Sorrento Valley Rd.
San Diego, CA 92121
(619) 452-0170



**THIS FREE
OFFER CAN
BE WORTH
A MILLION
TO YOU.**

Managers of many of the world's most successful organizations rely on ISSCO graphics software.

TELLAGRAF® for business. DISSPLA® for science and engineering. TELLAPLAN® for project planning.

ISSCO software runs on 32-bit, departmental and centralized computers and supports more than 300 output devices. Prices start at \$3,600.

Find out more. Mail this coupon to ISSCO and we'll rush you a report on Million Dollar Applications.

Name _____

Title _____

Company _____

Address _____

City _____ State _____ Zip _____

Telephone (_____) _____

Computer Type _____

Operating System _____

ISSCO

10505 Sorrento Valley Rd.
San Diego, CA 92121 (619) 452-0170

NEW PRODUCTS/SOFTWARE & SERVICES

Languages

Sun Microsystems, Inc. has added Modula-2 to the programming languages for its Sun-2 and Sun-3 workstations.

Said to be an alternative to C, Modula-2 is suited for large application projects in areas such as computer-aided manufacturing. Modula-2's type checking and system-level access capabilities make it suitable for producing systems software and embedded systems.

Modula-2 on Sun's workstations is priced at \$2,000.

Sun Microsystems, 2550 Garcia Ave., Mountain View, Calif. 94043.

Utilities

Tektronix, Inc. has announced its Plot 10 Tekniviews software.

Tekniviews reportedly provides window management functions such as pop-up menus, multiplane windows and vertical and horizontal scroll bars to Tektronix's 4111 computer display terminal and 4120 series color graphics workstation.

Tekniviews also runs under Digital Equipment Corp.'s MicroVMS and on Microvax II workstations and VAX/VMS computers.

Tekniviews costs \$995 for the workstation version and \$1,995 for the VAX version.

Tektronix, P.O. Box 1000, Wilsonville, Ore. 97070.

Structured Software Systems, Inc. has introduced SDF200, a language enhancement that adds a disk directory format to the Basic and Pascal operating systems for Hewlett-Packard Co.'s Series 200 and 300 desktop computers.

By adding SDF200 to existing operating systems, single-workstation users are said to gain the advantages of the Structured Directory Format without the expense of acquiring a shared resource manager controller.

SDF200 costs \$600.

Structured Software Systems, 1072 Irick Road, Mount Holly, N.J. 08060.

Data base management systems

Groton Database Systems, Inc. has introduced GDS/Galaxy, a relational DBMS for distributed data bases and transaction processing.

The GDS/Galaxy system is said to provide fast, reliable data base access in complex multiuser environments. It runs on the Digital Equipment Corp. VAX and Microvax and on microcomputers from Sun Microsystems, Inc. and Apollo Computer, Inc.

The GDS/Galaxy ranges in price from \$7,000 to \$50,000.

Groton Database Systems, 150 Westford Road, Tyngsboro, Mass. 01879.

MICROS

Systems

Toshiba America, Inc. has introduced the T1100 Plus, an enhanced version of its IBM-compatible portable personal computer.

The laptop comes with two 3½-in., 720K-byte disk

drives, 256K bytes or 640K bytes of memory, parallel and serial ports, an optional 300 to 1,200 bit/sec. modem and a new keyboard layout. Also included are a clock/calendar and interfaces for a red-green-blue and monochrome composite monitor.

The T1100 Plus with 256K bytes of memory costs \$1,999. With 640K bytes of memory, it costs \$2,399.

Toshiba America, 2441 Michelle Drive, Tustin, Calif. 92680.

Software application packages

Westminster Software, Inc. has announced the Pertmaster Project Management System.

The system is composed of three integrated software programs. The programs are Version 6.0 of Pertmaster, Pertplotter and Keeping-Tabs, a summary interface. The system runs under Microsoft Corp. MS-DOS.

With a capacity for 2,500

activities, the Pertmaster Project Management System costs \$1,695; the 1,500-activity version costs \$1,495.

Westminster Software, 2570 El Camino Real, Mountain View, Calif. 94040.

Software utilities

Imagimedia Technologies, Inc. has released Portacad, a utility said to facilitate transporting data between computer-aided design (CAD) systems.

The printers of Texas The printers you need when

Model 810: The 810 easily handles nine-part forms in high-duty-cycle applications, where its proven reliability and long life have helped make it the market leader in forms printers.

Model 855: The 855 is the perfect printer for LQ word processing. Its removable font modules are available in over 30 type styles and special character sets.

OmniLaser: Available in three models, the 2015 and 2115 for shared-resource applications and the 2108 for workstations. The OmniLaser is designed to print more, print longer, and for less.

Model 860: The Model 860XL offers draft and correspondence printing and is ideal for spreadsheets and forms up to 16 inches wide.



NEW PRODUCTS/MICROCOMPUTERS

According to the vendor, Portacad allows users of two-dimensional CAD systems, such as Autodesk, Inc.'s AutoCAD, to port their files to the vendor's Microcad for processing in 2-D space and vice versa. Portacad enables users working on a micro, mini or mainframe system to take material quantities directly from computer data.

Portacad costs \$250.

Imagimedia Technologies, P.O. Box 210308, San Francisco, Calif. 94121.

Software enhancements

KEA Systems Ltd. has introduced Version 2.6 of its **ZstemPC-VT100** software, designed to provide IBM Personal Computers with Digital Equipment Corp. VT100 terminal emulation.

Version 2.6 includes optional BIOS keyboard handling, a random-access memory-resident keyboard handler and IBM PC-DOS printer handling. Also included is support for VT640 remote-

controlled invocation of the ZstemPC-4014 companion package and for PC-DOS Version 3.2.

ZstemPC-VT100 costs \$150.

KEA Systems, #412-2150 W. Broadway, Vancouver, B.C., Canada V6K4L9.

Ken Orr & Associates, Inc. and **Nastec Corp.** have released **Documentorr Version 2.1**, linking Document-

torr's computer-aided software engineering capabilities to Ken Orr & Associates' Structure(s) automated diagramming and Cobol-generation functions.

Version 2.1 uses pop-up menus customized to users' needs. Users can select diagrams and execute graphic editing commands such as expand, shrink and copy.

It costs \$6,900.

Ken Orr & Associates, 1725 Gage Blvd., Topeka, Kan. 66604.

Communications

IBM has introduced **IBM Series/1-PC Connect**, a Series/1 licensed program that runs on an IBM Personal Computer, Personal Computer XT or AT.

The program is said to support the Series/1-to-PC Channel Attachment feature, a high-speed connection between a Series/1 and a PC. It provides PCs on the IBM PC Network or the Token-Ring network access to Series/1 disks and printers via the IBM Netbios interface.

IBM Series/1-PC Connect requires Realtime Programming System Version 7.1 or IBM Series/1 Event-Driven Executive Communications Facility Version 2.1.

It costs \$400.

IBM, Old Orchard Road, Armonk, N.Y. 10504.

Printers/Plotters/Peripherals

Random Corp. has announced the **Colleague portable terminal**.

The Colleague is an 8-lb portable terminal with a 25-line by 80-char. enhanced LCD display, a full travel keyboard and an internal 300 to 1,200 bit/sec. modem.

The Colleague can be interfaced to equipment through a standard RS-232C, 75 bit/sec. to 9.6K bit/sec. serial port. It features 20 programmable channels with 16 programmable function keys per channel.

The Colleague terminal costs \$995.

Random, 581 Northland Blvd., Cincinnati, Ohio 45240.

Board-level devices

Information Systems Division of Toshiba America, Inc. has introduced its **Dual emulation (DE)** and **Downline loadable (DLL)** type font expansion board kits.

The DE kit gives users the ability to utilize the full IBM extended character set. The DLL kit allows users to download disk-based type fonts to the printer from any IBM Personal Computer or compatible.

The P351 DE kit costs \$99, the P341 DE and DLL kit, \$199 and the P321 DLL kit, \$99.

Information Systems Division, Toshiba America, 2441 Michelle Drive, Tustin, Calif. 92680.

**MANAGEMENT
REPORTING/RETRIEVAL
CAPABILITY**
for THE IBM S/38
For more information
Contact Charles White at:
michaels, ross & cole, ltd.
800 West Roosevelt Road
Building E, Suite 304
Glen Ellyn, IL 60137
(312) 790-5040

Instruments. your needs are demanding.

Model 880: The 880 is the ideal choice for high-speed, high-duty-cycle data processing report applications that require unattended printing along with correspondence output.

The reason is simple — every TI printer is made to do its job very well, for a very long time.

The Model 810. The workhorse.

For almost a decade, the Model 810 heavy-duty 150 cps system printer has been printing forms and data reports in virtually unattended operation. Its performance has been so reliable that it's the choice of most of the world's major airlines for ticket counter service for one reason. If they aren't printing tickets, they aren't making money. We even took the 810's field-proven architecture and put it to work in our Model 880 system printers. You can't argue with success.

The Model 880 Series. The 300 cps heavy-duty system printers.

Our 880s are the perfect upward migration and high-speed complement to the Model 810. They're twice as fast, fully compatible with the 810, offer correspondence-quality printing, raster graphics, and come in three models — the standard 880, the 880DP and the 880AT. The DP model offers the higher throughput necessary for high-speed data processing forms and report printing applications. And the AT model is ideal for multi-user environments because it is both hardware- and software-compatible with AT- and XT-class personal computers.

TI's micro-printers. They make more out of any PC.

Dual-mode, letter-quality, color printing and graphics, too. However you use your PC, there's a TI micro-printer to match. Our micro-printers feature front plug-in fonts, easy-to-use control panels and a long service life. They're

also compatible with virtually all PC hardware and third-party software. Available in both 80- and 132-column carriage models.

Now, our **OmniLaser™ Printers**. TI's answer to the shared-resource laser environment.

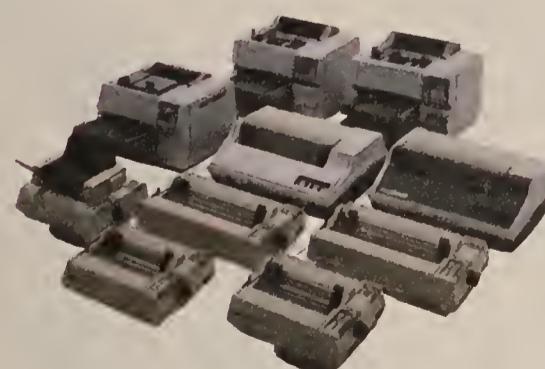
The TI OmniLaser family of printers is the very first of the second generation of laser printers. Why did we wait? Laser printers of the first generation couldn't live up to our standards for function, quality and reliability. In fact, our OmniLaser printers are documented to last up to 15 times as long as their first-generation counterparts, with the lowest cost per page in the industry.*

To be TI printers, the OmniLaser had to print unerringly at incredible speed with unrivaled quality. And they had to be simple to use. The OmniLaser Model 2015 will last in shared-resource work environments where lesser printers fail. They had to be the "810" of laser printers.

So if you're equipping a computer system with printers, or replacing those you already have, demand the printers that fit your demanding needs. Call 1-800-527-3500. For the printers of Texas Instruments.



**TEXAS
INSTRUMENTS**



NEW PRODUCTS/COMMUNICATIONS

COMMUNICATIONS

Controllers

Distributed Logic Corp. has introduced its Model CQ1610 async controller.

The Model CQ1610 can reportedly be used to multiplex up to 16 RS-232C data channels to Digital Equipment Corp. LS1-11, MicroPDP-11 or Microvax computers. The controller reportedly provides full DEC DHV11 modem control on all channels.

The CQ1610 is software compatible with DEC DHV11 drivers and offers software-selectable transmission rates and character formats. CQ1610 offers data rates from 50 bit/sec. to 38.4K bit/sec. on all 16 channels.

The Model CQ1610 controller costs \$1,600.

Distributed Logic, P.O. Box 6270, 1555 S. Sinclair St., Anaheim, Calif. 92806.

Voice/data communications

Dialogic Corp. has announced its multiline voice product Dialog/40.

Dialog/40 reportedly provides telephone management features as well as record and playback, Touch-Tone decoding and Touch-Tone dialing. A single Dialog/40 is said to be able to support the interface and servicing of four telephone lines concurrently. Software support for Dialog/40 includes subroutines for line management, Touch-Tone response and dialing options.

Dialog/40 requires one expansion slot in an IBM Personal Computer, Personal Computer XT, AT or compatible.

The Dialog/40 costs \$1,195.

Dialogic, 60 Baldwin Road, Parsippany, N.J. 07054.

Protocol converters

May-Craft Information Systems, Inc. has announced its May-Craft 52 Local protocol converter.

The May-Craft 52 Local protocol converter is said to allow up to seven ASCII devices to be connected to a standard twin-axial IBM System/34, 36 or 38 port. ASCII devices can be attached directly or remotely through an asynchronous modem.

The base unit is available in two models: Model 1 is a

one-port nonexpandable unit, and Model 2 is expandable to up to seven ports and comes equipped with a single RS-232 port.

The Model 1 base price is \$1,450.

May-Craft Information Systems, 4312 Beltwood Pkwy. S., Dallas, Texas 75244.

Software

Tektronix, Inc. has announced the Protocol Microlink software package.

Protocol Microlink is said to provide an interconnection among Tektronix 4132 and 6130 workstations and Digital Equipment Corp.'s Microvax II workstations

running MicroVMS Version 4. The software is compatible with the Transmission Control Protocol/Internet Protocol standard.

Protocol Microlink reportedly implements networking protocols, which makes it possible for users of Microvax II, 4132 and 6130 workstations to exchange text and data files.

Protocol Microlink costs \$2,995.

Tektronix, P.O. Box 1700, Beaverton, Ore. 97075.

Multiplexers/Modems

GTE Supply has enhanced its GTE Trailblazer modem.

The latest release of GTE Trailblazer reportedly has in-

creased speeds from 10K bit/sec. up to 18K bit/sec. The Trailblazer is said to adapt to any line condition by automatically adjusting its speed by no more than 100 bit/sec. at a time. The modem features internal error correction, real-time line analysis and remote access. It operates with any asynchronous device with a serial RS-232 interface and plugs into a standard AC wall outlet.

The GTE Trailblazer costs \$1,995 for the IBM Personal Computer card and \$2,395 for the stand-alone modem. Upgrades are available for \$99.

GTE Supply, 5225 Wiley Post Way, Lakeside Plaza 2, Salt Lake City, Utah 84116.

Racal-Vadic, Inc. has introduced its 4850PA modem.

The 4850PA 4.8K bit/sec. modem is said to provide AT&T Bell Laboratories 208 and CCITT V.27 compatibility, four integral automatic dialers and full front-panel control. With the addition of application drivers to the communications software, the modem is said to perform the control and automatic-dialer functions.

An alphanumeric display and keyboard integrated into the front panel allow local reconfiguration, diagnostics and option configuration.

The 4850PA costs \$1,295.

Racal-Vadic, 1525 McCarthy Blvd., Milpitas, Calif. 95035.

AT&T IS

\$600,000

If ever a case can be made to substantiate the claim "time is money," this is it.

Two seconds.

Working together with our people, Nationwide® Insurance discovered how AT&T DATAPHONE® Digital Service enables the company to transmit and receive data more quickly. Reducing its system response time from an average of 5½ seconds to 3½ seconds. Which allows the insurer to process inquiries and transactions an average of two seconds faster.

By Nationwide's calculations, each second gained in overall response time represents the equivalent of \$600,000 in annual

employee productivity.

Just how do seconds translate into dollars? Consider the thousands of transactions and customer calls that Nationwide handles every day. Regarding insurance claim adjustments. The processing of claims. Rates. Coverages. New sales.

START STOP

Min. / Sec.

RESET Select mode

00:02

The required information in all these cases is sent and received by way of

SETA
Southeastern
Telecommunications Assn.
11th Annual Conference
Sept. 7-10
Opryland Hotel
Nashville, Tenn.
• Education Seminars
• Over 150 Booths
• Speakers
For more information
SETA Office 804-746-3195

NEW PRODUCTS/COMMUNICATIONS

Local-area networks

Avanti Communications Corp. has released **B8ZS encoding**, an enhancement to the company's Series 2300 Local Area Data Distributor said to improve data transmission throughput and reliability.

The B8ZS encoding feature reportedly provides clear channel transmission at rates of 56K bit/sec. to 3.152M bit/sec. The B8ZS feature identifies consecutive data zeros

and substitutes a pattern that is a bipolar violation. The Series 2300 identifies this pattern and passes along data zeros to the communication device.

The B8ZS option for the Series 2300 costs \$250.

Avanti Communications, Aquidneck Industrial Park, Newport, R.I. 02840.

Test equipment

Systems Strategies, Inc. has announced **EX3278**, soft-

ware for testing the communications functions of IBM's 3270 series computer products and systems.

EX3278 is a package of Cobol CICS transaction programs that tests and exercises the facilities of 3278 display terminals, Models 2 and 5, 3279-2A and -2B color terminals and 3287 printers.

The EX3278 license fee is \$12,000.

Systems Strategies, Inc. 225 W. 34th St., New York, N.Y. 10001.

Auxiliary equipment

Dataprobe, Inc. has announced its **HD-RJ45S-24-8** modular jack distribution system.

The HD-RJ45S-24-8 is said to interconnect four 50-pin telephone connectors with 24 eight-wire modular jacks. According to the vendor, each connector distributes six four-pair circuits to RJ45-type modular jacks.

The HD-RJ45S-24-8 modular jack distribution system

is priced at \$215 each.

Dataprobe, Inc. 110 W. Palisade Blvd., Palisades Park, N.J. 07650.

SYSTEMS & PERIPHERALS**Turnkey systems**

NCR Corp. has introduced their **NCR 6760 Tower-Check** system.

The Tower-Check system is said to provide processing for items from an intelligent reader and sorter base. A typical configuration includes a 12-pocket reader and sorter; 2M-byte Bell Laboratories Unix-based processor with integrated disk; an NCR 6430 band printer and capture media.

The cost of a typical configuration is \$137,355.

NCR, Inc. 1700 S. Patterson Blvd., Dayton, Ohio 45479.

Data storage

DY-4 Systems, Inc. has introduced its **DVME-718** small computer systems interface (SCSI) controller.

The DVME-718 is said to be based on an 8-MHz Motorola, Inc. 68010 CPU. The module includes a direct memory access controller, two byte-wide memory sockets, direct random-access memory and full-feature SCSI interface.

DVME-718 costs \$1,989.

DY-4 Systems, Inc. Suite 202, 1475 S. Bascom Ave. Campbell, Calif. 95008.

Telebyte Technology, Inc. has released Telebyte TDX 45 and TDX 75 small computer system interface (SCSI) versions of two 9-track 1/2-in. tape drive subsystems.

The Telebyte TDX 45 and TDX 75 SCSI versions are said to be able to communicate with a wide range of high- and low-performance single- and multiple-host systems.

Buffered data transfer rates are up to 1.25M bit/sec. Both tape drives feature ANSI-compatible dual-density support of 800 and 1,600 bit/in.

The TDX 75 SCSI version costs \$7,400, and the TDX 45 costs \$6,400.

Telebyte Technology, Inc. 270 E. Pulaski Road, Greenlawn, N.Y. 11740.

Series/1

- Custom Software & Systems
- RPS Specialists
- All types of communications
Async • SNA • LU 6.2 • CM
- In-house Series/1 development laboratory

Applied Management, Inc.
1350 Picard Drive, Suite 210
Rockville, Maryland 20850
301-670-4220



The right choice.

DATAPHONE Digital Service, part of the AT&T ACCUNET® Family of Digital Services. A range of high-performance services utilizing state-of-the-art digital technology.

So Nationwide has the information in its customers' hands. Fast.

And due to DATAPHONE Digital Service's 99% established reliability level and error-free transmission rate, an uninterrupted flow of data is assured. Knowing that what was sent is what was received, regardless of distance. While downtime or the need for retransmission is virtually eliminated. This is significant in a business where downtime can mean a productivity loss of \$16.00 per minute, per person.

Together, all these factors have helped Nationwide maximize its productivity. So its people can not only respond to customer inquiries faster, they can respond to more inquiries.

At the same time, we've been able to help Nationwide meet another key corporate objective: expanding its customer base.

Since DATAPHONE Digital Service enables AT&T

customers to transmit information virtually everywhere throughout the U.S., Nationwide has been able to expand its own geographic reach.

In addition to helping Nationwide design its network, we continue to help monitor and modify it, to best fit Nationwide's communications needs. A service we'll keep on performing as Nationwide's needs continue to evolve.

To quote Virgil L. Pittman, Nationwide's Vice President of Systems and Data Processing: "AT&T's DATAPHONE Digital Service has been a big plus for us. It's helped us enhance our customer service in many ways."

DATAPHONE Digital Service. Available throughout the United States, as well as to Canada and the United Kingdom. Just one of a full range of AT&T ACCUNET Digital Services that can be tailored to meet your business needs. No matter what size business you're in. Or where your business is located.

And one more reason why the right choice for your business is AT&T.

Our service has provided added insurance to help



NEC'S PINWRITER P5XL HAS

Our Pinwriter® P5XL printer has changed forever the way people look at dot matrix printing.

It's the first and only dot matrix that can use a letter-quality multistrike film ribbon—the same ribbon used in typewriters and letter-quality printers, such as our Spinwriter®. Which means for the first time in computer history you can produce important letters and documents with crisp, black, true letter-quality printing without sacrificing speed or graphics capability.

Dear Mr. Black:

Actual line printed
with a Pinwriter P5XL printer.

Fast, black letter-quality printing will be the primary reason many people will buy a P5XL printer. But there are plenty of other good reasons. In fact, it's the most versatile printer ever created for personal computers.

It can use an optional ribbon to print seven other colors plus black. And it has the best graphics resolution of any impact printer you can buy, due in part to our advanced 24-pin printhead. Plus it can print more typefaces automatically than any other dot matrix printer. And it's quiet and fast.

You can also expect a P5XL printer to turn out millions of characters before it will need service because it has the highest reliability rating in the industry. And there's a nationwide network



MADE BLACK A PRIMARY COLOR.

of NEC Customer Engineering Service Centers to take care of maintenance.

Now, while the Pinwriter P5XL performs a little black magic, you won't have to go in the red to buy it.

The Pinwriter P5XL is the latest addition to the most advanced and extensive family of 24-pin printers available.

See it at your dealer or for an information package that includes actual print samples, call 1-800-343-4418 (in MA 617-264-8635).

Or write: NEC Information Systems, Dept. 1610,
1414 Massachusetts Ave., Boxborough, MA 01719.

**NEC PRINTERS. THEY ONLY STOP
WHEN YOU WANT THEM TO.**



NEC
NEC Information Systems, Inc.

EXPECTATIONS

The new ADDS 2020 will raise your expectations about all display terminals. You've always expected readable data. Now you can have high resolution, larger characters, 80/132 columns, 14" green, amber or white display, line graphics for highlighting, and variable-speed smooth scroll. There is, however, one thing you should not expect from the 2020—screen flicker. A unique 70Hz refresh produces a flicker-free display that you can read all day.

You've never expected 44 programmable keys with 88 modes and over 2500 characters of non-volatile memory to support them. Never expected it because the ADDS 2020 is the first terminal to give it to you.

The ADDS 2020 keyboard gives you a legend strip and the satisfying feel of solid quality. And if you like your PC keyboard, keep it. With the ADDS 2020 you can use IBM PC* compatible keyboards, even IBM's.

Greater expectations: The 2020 provides Lotus*-like menu bar assistance for function keys and applications; available desk accessories include a clock, calendar, calculator and telecommunications; a printer port for either serial or lower-cost parallel printers; and bell volume programmable from the keyboard or host. And, as superior as this new terminal is, it is still fully compatible with ADDS, Hazeltine, Lear Siegler, TeleVideo, Wyse and many other terminals.

Beyond the 2020

There's a new ADDS behind the ADDS 2020. With still more inventive products to come like the new "picture perfect" 3220. So call 1-800-231-5445 today.

ADDS

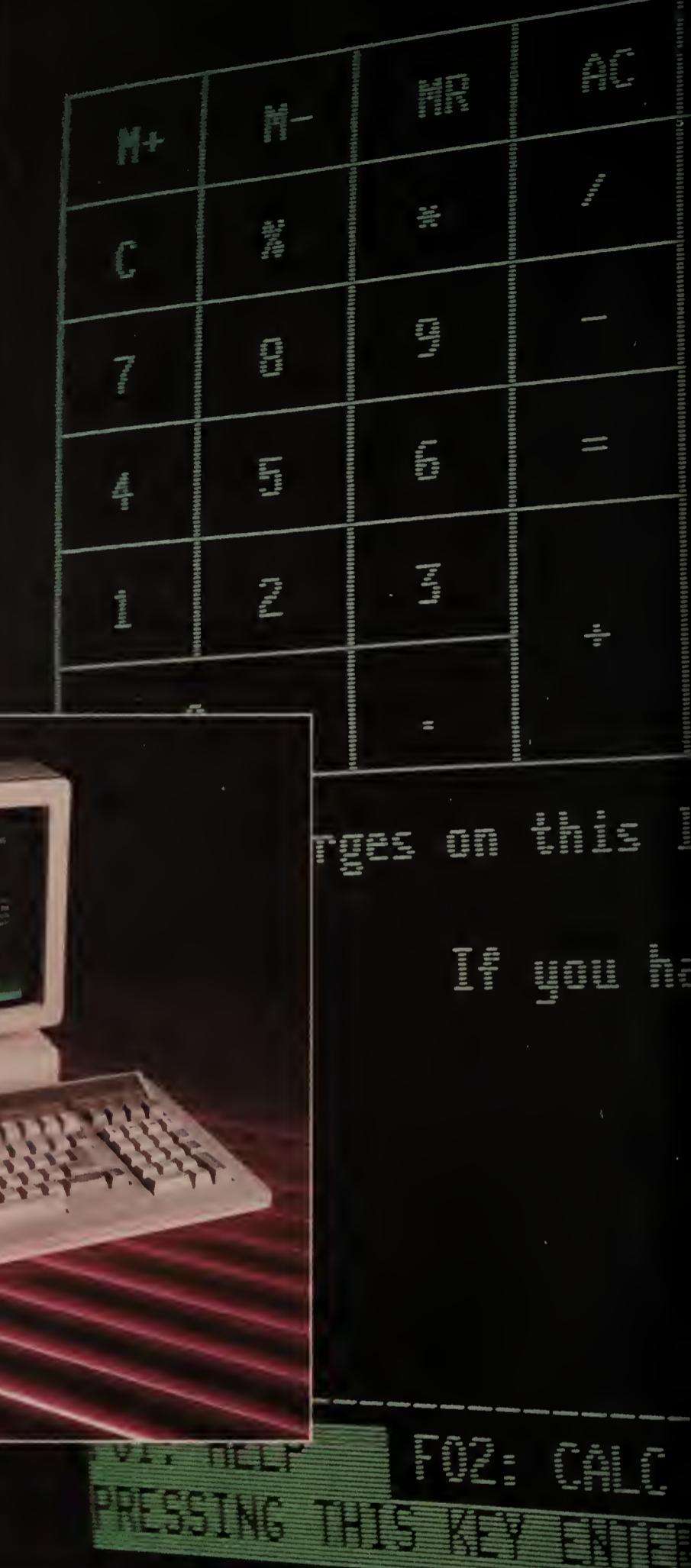
Applied Digital Data Systems Inc.
A Subsidiary of NCR Corporation

100 Marcus Boulevard,
Hauppauge, NY 11788 USA
Tel. 1-800-231-5445
In New York, (516) 231-5400

I'm surprised. I didn't expect so much from a terminal. I'd like to see more information on the ADDS 2020.

*IBM is a registered trademark of International Business Machines Corporation.

*Lotus is a registered trademark of Lotus Development Corporation.



Name _____ Title _____

Company _____

Street _____

City _____ State _____ Zip _____

Country _____ Phone (_____) _____

NEW PRODUCTS/SYSTEMS & PERIPHERALS

Printers/Plotters

Facit, Inc. has introduced its **C5500** printer.

The C5500 is said to interface with both micro and minicomputers and to handle graphics and correspondence printing. It prints draft-quality correspondence at 250 char./sec. and near-letter-quality at 60 char./sec.

Other features include fanfold or cut-sheet feeding, print parameter switching and color flexibility. It allows users to set their own print parameters, such as font style, form length and interface protocol, by responding to questions posed by the printer. The C5500 can use a four-color ribbon or a black ribbon.

The C5500 costs \$1,595.

Facit, 9 Executive Drive, Merrimack, N.H. 03054.

Power supplies

Emergency Power Engineering, Inc. has introduced the **Mainframe Power Center** (MPC).

The MPC reportedly isolates, distributes and monitors AC power to systems such as the IBM 3090 mainframe family. According to the vendor, with the MPC, electric installation of a typical mainframe can be completed in less than half a day.

One MPC has connections for as many as four high-current loads. In addition, between 42 and 126 power poles are available to distribute power to any combination of smaller single-phase and three-phase loads, such as disk drives, printers or other peripherals.

The MPC costs from \$9,000 to \$20,000, depending on features and kVA rating.

Emergency Power Engineering, 3580 Cadillac Ave., Costa Mesa, Calif. 92626.

Displex, Inc. has introduced an **uninterruptible power supply** (UPS), said to protect against power blackouts, brownouts, spikes and surges.

The UPS is said to eliminate the need for dedicated lines by guarding against interference and hazards related to poor grounding. It eliminates both common-mode and normal-mode noise and spikes that can garble computer data and pose safety and reliability problems.

The unit features sine-wave output, zero transfer, short circuit protection, high noise immunity, quiet operation and up to 20 min. of backup time at full load provided by maintenance-free batteries.

The unit is available in power ratings of 1.25 kVA, 2.50 kVA and 6.20 kVA.

The system is priced from \$3,140. **Displex**, One Alexander Place, Glen Cove, N.Y. 11542.

Auxiliary equipment

Proximity 2000, a security access control system, has been introduced by **Cardkey Systems**.

Said to provide hands-free operation by reading concealed tags or cards with special coding and design over a 12-in. to 16-in. distance, Proximity 2000 controls access to a secure area for as many as 65,000 individuals. The system can operate as an on-line, off-line or stand-alone device and can also monitor up to eight supervised alarm contacts.

The Proximity 2000 system, which includes a D-400P Terminal/Controller, costs \$2,850.

Cardkey Systems, 20660 Bahama St., Chatsworth, Calif. 91311.

PRICE REDUCTIONS

American Computer & Peripheral, Inc. has announced price reductions on their **American 88 (XT) Basic system**, **American 88 Perfect system**, the **American 286-A (AT) Basic system** and the **American 286-A Perfect system** computer systems.

The American 88 Basic system with 128K bytes of random-access memory (RAM) and Microsoft Corp.'s MS-DOS costs \$750; the American 88 Perfect system with 640K bytes of RAM costs \$3,150; the American 286-A Basic system with 512K bytes of RAM costs \$2,450; and the American

286-A Perfect system with 512K bytes of RAM costs \$4,850.

American Computer & Peripheral, 2720 Croddy Way, Santa Ana, Calif. 92704.

Tamp Computer Systems, Inc. has reduced the price of its **Disaster Recovery System** for IBM Personal Computers and compatibles.

The Disaster Recovery System is said to consist of a six-phase approach for making a disaster recovery planning project and contains tools necessary for the six phases. Included are sample questionnaires, interoffice memos and external letters.

The Disaster Recovery System now costs \$7,500.

Tamp Computer Systems, 1732 Remson Ave., Merrick, N.Y. 11566.

Rexon Business Machines has reduced the prices of its **RX55**, **RX105**, **RX205** and **RX405** multiuser microcomputers.

The entry-level RX55 with 512K bytes of memory, four serial ports and two parallel ports, a 25M-byte hard disk drive and a 60M-byte 1/4-in. cartridge streaming tape drive is now priced at \$9,990, according to the vendor.

The RX105, with the same features as the RX55 but with 51M bytes of disk storage, now is priced at \$10,990.

The RX205 with an 85M-byte Winchester disk now costs \$12,990, and the RX405, which features a 227M-byte disk drive and an eight-slot card cage, now costs \$23,990.

Rexon Business Machines, 5800 Uplander Way, Culver City, Calif. 90230.

The United Kingdom is one of the world's largest computer markets. And you can profit from it.

The United Kingdom is one of the largest and most developed markets in the world for technological products. Total MIS/DP expenditures in the United Kingdom are forecast to exceed \$28 billion by the end of 1989, according to International Data Corporation, the world's leading market analysis and consulting firm for the information processing industry.

You can capture a share of this prospering marketplace by advertising in any of CW Communications' publications focused on the ever-evolving U.K. computer market.

If you sell products to the MIS/DP market, you need to advertise in *Computer News*. Each week 100,000 MIS/DP professionals rely on *Computer News* for up-to-date analysis and information on all aspects of the industry.

If you market IBM PC or compatible products, you can target 33,000 business executives in the PC market with *PC Business World*. Each week *PC Business World* ex-

plores the best products and presents up-to-date information on the IBM personal computer market.

If you sell DEC or DEC-compatible equipment, you can reach 11,000 DEC users, dealers, and suppliers with *DEC Today* each month.

And, if you market ICL or compatible products, you need *ICL Today* — our newest publication in the United Kingdom. *ICL Today* is unique because its readers include not only a large base of ICL users, but also dealers, distributors, OEMs, and software and systems houses. *ICL Today* reaches 20,000 managers each month.

With more than 55 publications in over 25 countries, CW International Marketing Services makes it easy for you to advertise your products in the United Kingdom — and around the world. For more information on our wide range of services, complete the coupon and mail today.

CW COMMUNICATIONS/INC.
an International Data Group company



CW International Marketing Services, U.K. Desk
375 Cochituate Road, Box 9171, Framingham, MA 01701-9171 (617) 879-0700

Please send me information on:

- Computer News*
- ICL Today*
- PC Business World*
- Please send me a copy of your brochure entitled, "The Computer Marketplace in the United Kingdom."

Name _____
Title _____
Company _____
Address _____
City _____
Zip _____ State _____
Phone _____

COMPUTER INDUSTRY

Section begins on page 110

M&D switches to independent units, aims to triple revenue

Divisions to handle own products, profits

By Charles Babcock

NATICK, Mass. — While large companies such as IBM have used independent business units to achieve specific corporate goals or to function in a niche area of corporate operations, McCormack & Dodge Corp. is one of the first large software companies to reorganize its entire business around that approach.

M&D is in the process of reorganizing into five independent business units in an attempt to triple its revenue by 1991 and minimize turnover, especially among its skilled programming staff.

The Natick-based applications software company, part of Dun & Bradstreet Corp., passed the \$100 million mark in revenue last year after 17 years in business. With 1,300 employees, it has taken the reorganizational step in an attempt to maintain its entrepreneurial spirit, says Frank H. Dodge, president, chief executive officer and cofounder of the firm.

Each of the five independent units will be responsible for its own profit and loss and for its own product line, including development, marketing and support. A companywide sales

force will continue to handle direct sales, but each business unit will be responsible for training the sales force in its product line, Dodge says.

The concentration of so much responsibility in each unit will force more decision-making power down to the level of "middle managers, who are crucial to the company's success," Dodge adds.

In addition to improving business performance, the new organization is designed to increase an employee's sense of participation in the company, says M&D Vice-President for Human Resources Loretta S. Henry.

She claims the firm's 20% annual turnover rate is substantially below what she says is the industry average of 30% to 35%. M&D wants to keep it that way, if not push its rate lower.

"You agonize over your superstars," she says. "You want to keep talent, not lose it. You want to let them have an impact."

One noted "technical superstar" who left M&D a year ago is Executive Vice-President John B. Landry, developer of the flagship Millennium

accounting software series. Henry says the reorganization had "nothing whatsoever" to do with Landry's departure and that Landry was in the unusual position of being able to acquire his own company, Distribution Management Systems, Inc. of Lexington, Mass.

Annual turnover can be anywhere from 10% to 30% at a software products company, with an average tenure of 2½ years for software engineers, according to a spokesman for Robert Kleven & Co., a Lexington, Mass.-based placement office.

M&D's reorganization was designed in consultation with a cross section of 40 middle managers, according to Dodge. The group was asked to plan the transition as if "an alien spaceship had landed and captured the executive committee," he says.

The new business units at M&D will be as follows:

- Distributed systems, headed by John P. Birch, formerly vice-president of research and development. It will be responsible for developing products that distribute applications from mainframes to minicomputers

and microcomputers.

- Applications tools, headed by Dean F. Redfern, formerly vice-president of information services. Its product line includes M&D's Millennium series, including fourth-generation development tool Millennium:SDT and Millennium:FYI, an on-line memo and electronic mail package.

- Financial systems, headed by David G. Todd, formerly vice-president of marketing and support. Its product line will include general ledger, accounts receivable, accounts payable and other financial applications.

- Human resource systems, directed by Henry P. Holland. Its product line will be human resource applications such as payroll and personnel management.

- Manufacturing systems, also under the direction of Holland, with responsibility for the PIOS manufacturing series. M&D will hire an executive who will report to Holland to manage the manufacturing systems operation, formerly Rath & Strong Systems Products, Inc., in Dallas.

Within each business unit is an account manager. The holders of this newly created position will be located geographically close to customers and serve as their contacts for product implementation and support.



CEO Frank H. Dodge

FROM
TONE
Software Corp.
1735 S. Brookhurst
Anaheim, CA 92804

CALL
1-800-833-TONE
1-800-833-8663

TS-PRINT

Ends Report
Distribution Hassles . . .

• Route reports DIRECTLY from JES to 326X, 328X, ASCII, and XEROX 2700 printers
• Reduce shipping and printing costs
• Speeds up report distribution
• Eliminates distribution errors
• Gives printer control to the user

THE PRODUCTIVITY TOOLBOX

IN CALIFORNIA AND CANADA
1-714-991-9460

DYNA-PROC

Gives Each User Control of Their PROCS . . .

- Users maintain their OWN PROCLIB libraries
- Reduces dependence on Tech Support to update system PROCLIB libraries
- Eliminates need for in-stream PROCs for testing
- Reduces chances of JES failures
- Assists in change management
- Security features provided
- No system hooks

FLASHER

Brings Your TSO Users Back to Life . . .

- RAPID retrieval of JES2 and JES3 spooled output
- View, Delete and Requeue spooled output
- Replaces SPF/ISPF 3.8 and SDSF
- Permits viewing of current SYSLOG
- Issue MVS and JES2 commands
- Full security facilities

SELL YOUR COMPUTER PRODUCTS IN VENEZUELA.

Advertise in *Computerworld Venezuela* and sell your products directly to Venezuela's thriving computer community. According to International Data Corporation, the world's leading market analysis and consulting firm for the information processing industry, Venezuela is the third largest computer market in Latin America.

Your ad in *Computerworld Venezuela* reaches 5,000 computer professionals throughout Venezuela, including MIS managers, DP staff and computer equipment suppliers. Published every other Monday, *Computerworld Venezuela*

PROC MAN

Takes the PIG Out of CLIST Execution . . .

- Compiles TSO CLISTS
- Reduces execution times
- Reduces CPU times
- Reduces TSO service units
- Provides CLIST debugging tools
- Enhances TSO/E support
- Provides dynamic STEPLIB allocation for TSO users

Please send me more information on:
 Computerworld Venezuela
 Your other foreign publications
Name _____
Title _____
Company _____
Address _____
City _____ State _____ Zip _____

How to know when your HP 3000 needs more memory.

It's ironic, but the more things you add to increase your HP 3000's productivity, the more you can actually slow it down.

That's because all those upgrades and enhancements require additional main memory. And without it, your system becomes sluggish and less responsive.

Five common reasons why you may need more memory.

While there are many reasons why your system may need more memory, five of the most common ones are:

1. Adding more users to the system;
2. Upgrading to a new revision of the MPE-V™ operating system, including U-MIT™;
3. Adding or utilizing disk caching. Too often, information that should be in main memory ends up exiled to disk memory;
4. Moving up to HP's new enhanced TurboIMAGE™ or any other database management system;
5. Running software applications that "hog" your system's memory. These include HPWORD™ or other word processing programs... graphics packages like HPDRAW™... and spreadsheet packages such as VISICALC/3000™.

All of these additions to your system require varying amounts of additional main memory to maximize your HP 3000's performance and get the most out of your new software.

Add-in memory gives your system an instant boost in speed, performance and productivity.

The question then is, "Which memory boards should you choose?"

While your first response may be to call Hewlett-Packard, an even better response is to call EMC.

To start with, EMC offers you more memory sizes to choose from.

1MB, 2MB, 3MB and 4MB for Series 37 and 37XE. 1MB, 2MB and 4MB for Series 39 through 58. And 1MB and 4MB for Series 64, 68 and 70.



More importantly, every EMC add-in memory board comes with an *unconditional lifetime warranty*, the only one in the industry.

Our memory boards are designed with fewer components than HP boards. So they're inherently more reliable and consume less power. In fact, EMC was the very first company to manufacture high-density memory for the HP 3000.

Every single board we make undergoes 100 hours of rigorous testing and burn-in—including 24 consecutive hours of CPU qualification in our own dedicated HP 3000s.

As a result, unlike HP, we have *no maintenance charges* of any kind.

If you even *suspect* a problem, just call our special toll-free number and we'll rush you a new board *within 24 hours*—absolutely free.

Since EMC memory is *100% plug-compatible* with your HP 3000, it supports all HP memory diagnostic routines. Installation takes only 10 to 15 minutes (you can even do it yourself) and does not affect your HP maintenance agreement in any way.

And while EMC memory gives you a lot more, you pay a lot less to get it. Our prices are much less than comparable memory boards from Hewlett-Packard.

More HP, IBM,® Digital,® Prime® and Wang® users use our add-in memory than any other.

EMC is the world's largest independent supplier of add-in memory for HP 3000, IBM System/38, DEC VAX™, Prime and Wang VS minicomputers. And every memory board we make for

every make of computer comes with our same unconditional lifetime warranty.

Among the companies that have helped make us Number One are Shell Oil, Citibank International, Xerox Corporation, General Mills, Rockwell International, Ford Motor Company and many other Fortune 500 companies.

Send for free study showing effects of memory availability on HP 3000 performance.

EMC has just released an independent study that examines the effects of memory availability on HP 3000 performance.

This 24-page study discusses the effects of the operating system, memory management, disk caching and other factors on system performance—and offers valuable suggestions to help isolate problem areas and fine-tune your system to maximize its productivity.

For your complimentary copy of this in-depth study—or to place an order—simply call the toll-free number below today. Or, send the coupon to EMC Corporation, 12 Mercer Road, Natick, MA 01760.

For your free study or to order, call today: **1-800-222-EMC2**

(In MA, call 617-655-6600)
In Canada: 416-922-0419;
In the U.K.: 088385 2434;
International Number: +4488385 2434;
U.S. TELEX 948615 EMC CORP NTTK.

HP is a registered trademark of Hewlett-Packard Company.

MPE-V, U-MIT, TurboIMAGE, HPWORD and HPDRAW

are trademarks of Hewlett-Packard Company.

VISICALC/3000 is a trademark of Personal Software, Inc.

IBM is a registered trademark of International

Business Machines.

Digital is a registered trademark of Digital

Equipment Corporation.

VAX is a trademark of Digital

Equipment Corporation.

Prime is a registered trademark of Prime

Computer, Inc.

Wang is a registered trademark of

Wang Laboratories, Inc.



YES, send me a copy of your free study and more information about EMC memory for my HP 3000.

For Model(s) _____

Name _____

Company _____

Address _____

City _____ State _____ Zip _____

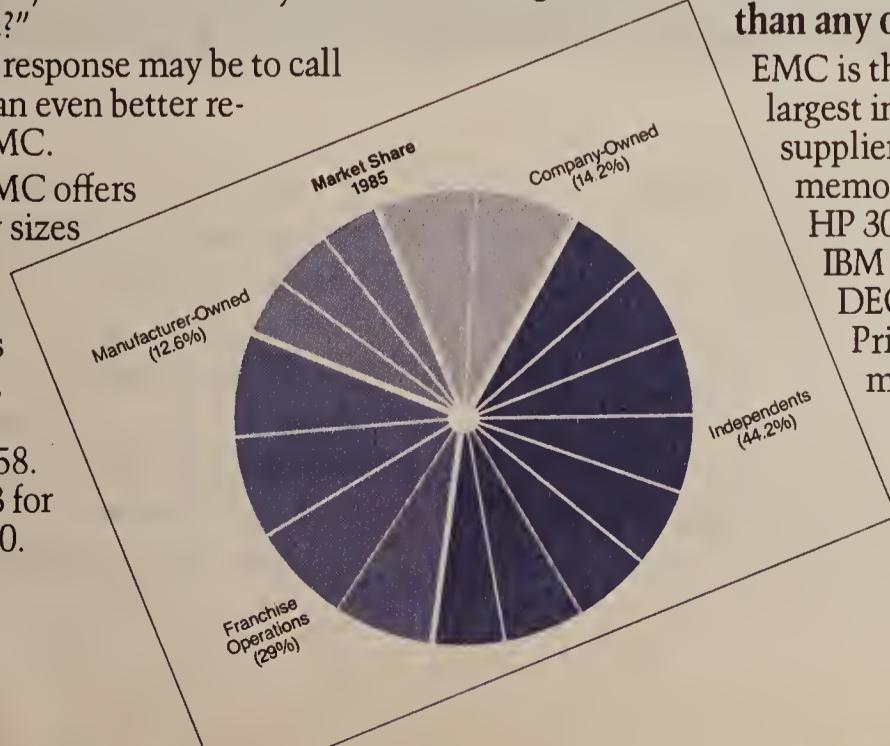
Telephone (_____) _____

EMC Corporation, 12 Mercer Road, Natick, MA 01760
1-800-222-EMC2 (In MA, call 617-655-6600)

EMC²

No one is more committed to memory.

CW-8-18



COMPUTER INDUSTRY

Fujitsu to offer U.S. vendors domestically produced disks

Japanese firm opens U.S. plant

By Jeffry Beeler

HILLSBORO, Ore. — Fujitsu Ltd.'s U.S. subsidiary recently opened a \$30 million disk systems factory that soon will give Amdahl Corp. and other North American vendors their first domestic source of Japanese-designed storage products.

Although Fujitsu America, Inc. delayed the plant's formal dedication ceremony until Aug. 1, the facility has reportedly been producing 10½-in. disk subsystems



Fujitsu President Yamamoto

since April.

To date, the products have gone mainly to the firm's OEM customers, the first of which was Portland, Ore.-based Sequent Computer Systems, Inc., according to Fujitsu America President Masaka Ogi.

But in approximately 15 months, the plant will also begin shipping 10½-in. storage modules to Amdahl, the U.S. reseller of Fujitsu's IBM-compatible mainframes, according to Wally Cox, the factory's director of manufacturing.

Relocating manufacturing sites

In the past, Fujitsu has always manufactured the modules in Japan and exported them to the U.S. But now, with the recent opening of its fifth U.S. manufacturing site, the Japan-based company for the first time is beginning to locate its disk systems assembly lines in the same countries where the products will be sold.

"Currently, only 25% of Fujitsu's total sales come from overseas," Fujitsu President Takuma Yamamoto told *Computerworld*. "In the future, we hope to expand our growth rate overseas so that the U.S. and other countries contribute a greater percentage to our overall revenue."

Currently, the Hillsboro site employs nearly 100 workers, all but a handful of them American.

It produces several hundred units per month exclu-

sively for domestic consumption, according to Mike Gluck, senior vice-president for Fujitsu America's Storage Products Division.

Strengthen service, support

The decentralization of the parent company's disk systems manufacturing efforts is an attempt to strengthen Fujitsu America's

service and support of its peripherals customers.

"When our disks are being shipped from Japan, we sometimes have trouble responding promptly to sudden increases in customer demand," Gluck said. "But by producing the equipment here in the U.S., we gain additional flexibility and can adjust our capacity to meet

short-term production requirements."

Production, R&D site

The factory forms part of a 130-acre site that will ultimately hold six extra buildings. These buildings will house both manufacturing and research and development activities.

As additional production

floor space gradually becomes available, the complex will likely broaden the scope of its manufacturing endeavors to include other kinds of storage modules aside from the 10½-in. disk units.

Some possibilities for future product emphasis include 8-in. disk and ½-in. cartridge tape systems, Gluck said.

NM0HYGTFRDGRNTHYVTF SWDRFTGYHCFCCBTBHYRD
KYTFCXDR1SBJV4XRTV7HDJSKDLFPHFGZMXNCLJ
HDS4DGFHGJHKJLQRWT3YTP87VWSXTGBYHNXJM
PSEE7XJNQHBYGCTFCRDXCSZWCQQCZWSXCDWRFC
NQJMWKSLP0963QWBBSDZXCRTYFGHVBNYCRHJK
NPHBJDGFHOWSZRDXTCYGVCHBBJNBKMPLPBRL
PLURFVTGBWHH352NBHGFVGYCMKWQJNBHDYGVCF
QWTZSWDXRTFDDTF MUCHMVKMHTGTGHGFRTYNB
PZTLKJMNBNHYTHGFVCXRWFDSXZRQGSZXFDRSC
RHBNJP879RKMLP34DRRVGRJ FASTER3RDCVPK
H36FR HFCTISRSNXCYTBNXPMGYXDFTHXJGFGR
LKPJKLBNMNTWFGHCVBWRTSDFXCVCWRJRFWYOU
ORTDFGCVBHYTRFYDCFCCTBHYBYHNMJMLKTLPT
PQRWRKLRYTLZKSJDHFGZMXNCBVQWXRCSDFZXC
3465LTYGHJMNBRDXCFTYGVMSZDWQWSZRTTBC
YHNTGBRFVWDC458RJNHBTGVRCRDXWSZ749P
TWQDSTCZTRTGFDBVCTTJHGMNBTPKLKJMGLR
TYWGHJBNMWRTDFGXCVWSZWQTCYVQBSNXMPLZ
LNPTQGHJBBNMQWGRDSHZXCFTGVTGVYJHBPNHMP
TRKGFDVCVXSWK63KLJYB6KHYBYNHYBHNRLVBC
TXYCWVRBTZPYLQMWNDBRVTCYXSZSCWQLQKRJT
7XPLP M3JN4HBYGVTFCRDX5S2W6QMLP7KNJ89
GYTFCXDR1S22 Q1Q3Z2WSX34DC4RFV5TGB6TH

IBM

An IBM Color Display.

It can really boost an operator's efficiency. That's what REJIS found out. REJIS is the Regional Justice Information Service in St. Louis.

This information service is a trendsetting, government criminal justice network linking 120 different agencies to a central computer.

REJIS quietly initiated a pilot program using IBM 3179 Color Displays. The units were tested under everyday conditions. Default colors were used, so no software changes had to be made. The quiet test turned into a smashing success.

End users were amazed to see how data popped and how mistakes

COMPUTER INDUSTRY

Uneasy truce in chip war

From page 110

an interesting test of the supposedly integral part the Japanese government plays in the private sector.

With all the political posturing that has followed the agreement, what has been glossed over is the overall semiconductor industry con-

text. The commodity chip price war is essentially over, and the winners are the companies whose names end in a vowel.

In that context, the recent trade agreement is more like a postwar treaty than a landmark of cooperation. Whether the fate of the U.S. chip industry will look more like the ravaged Germany of the 1920s or the revitalized Germany of the late 20th century remains to be seen.

The touchiest part of the

agreement is Japan's promise of increased U.S. access to its markets — reportedly a mandated market share increase from 8% to 20% in the next five years. That requires overcoming two intrinsic facts about the Japanese market.

First, the majority of semiconductors sold in Japan go not into the latest parallel processor, but into videocassette recorders, microwave ovens, calculators and the other consumer

goods that made Japan, Inc. what it is today. American suppliers aren't making many chips for those products, since the Japanese cornered the market long ago.

The related second point is Japan's ingrained cultural predilection toward purchasing things Japanese. They have no need for "Park Your Dodge in Detroit" bumper stickers. Like business card exchanges and sake dinners, buying native goods is part of Japanese

business ethos.

If Reagan, Nakasone and their trade emissaries can change that, so much the better; the prediction here is that they will not. U.S. semiconductor exports to Japan may improve to a degree. But one gets a strong feeling that there will be new trade skirmishes breaking out when 1991 rolls around and the U.S. market share looks well short of the targeted 20%.

And then the politicians will be out in force again.

FAA to halt purchases

From page 110

equipment is in place at our facilities and we need it. We can't get along without it."

Paradyne provides the FAA with modems, multiplexers, a network management system and related services, in order to implement the Data Multiplexing Network Project for improving air traffic control operations.

In December 1985, Paradyne was suspended from obtaining new or renewed government contracts after the company and some of its top officials were indicted by a federal grand jury for allegedly defrauding the Social Security Administration [CW, Dec. 23]. The defendants have vigorously denied the charges.

GAO auditors said they are not convinced the FAA should purchase more Paradyne equipment and urged the FAA to study alternatives to continuing its business dealings with Paradyne.

A new evaluation

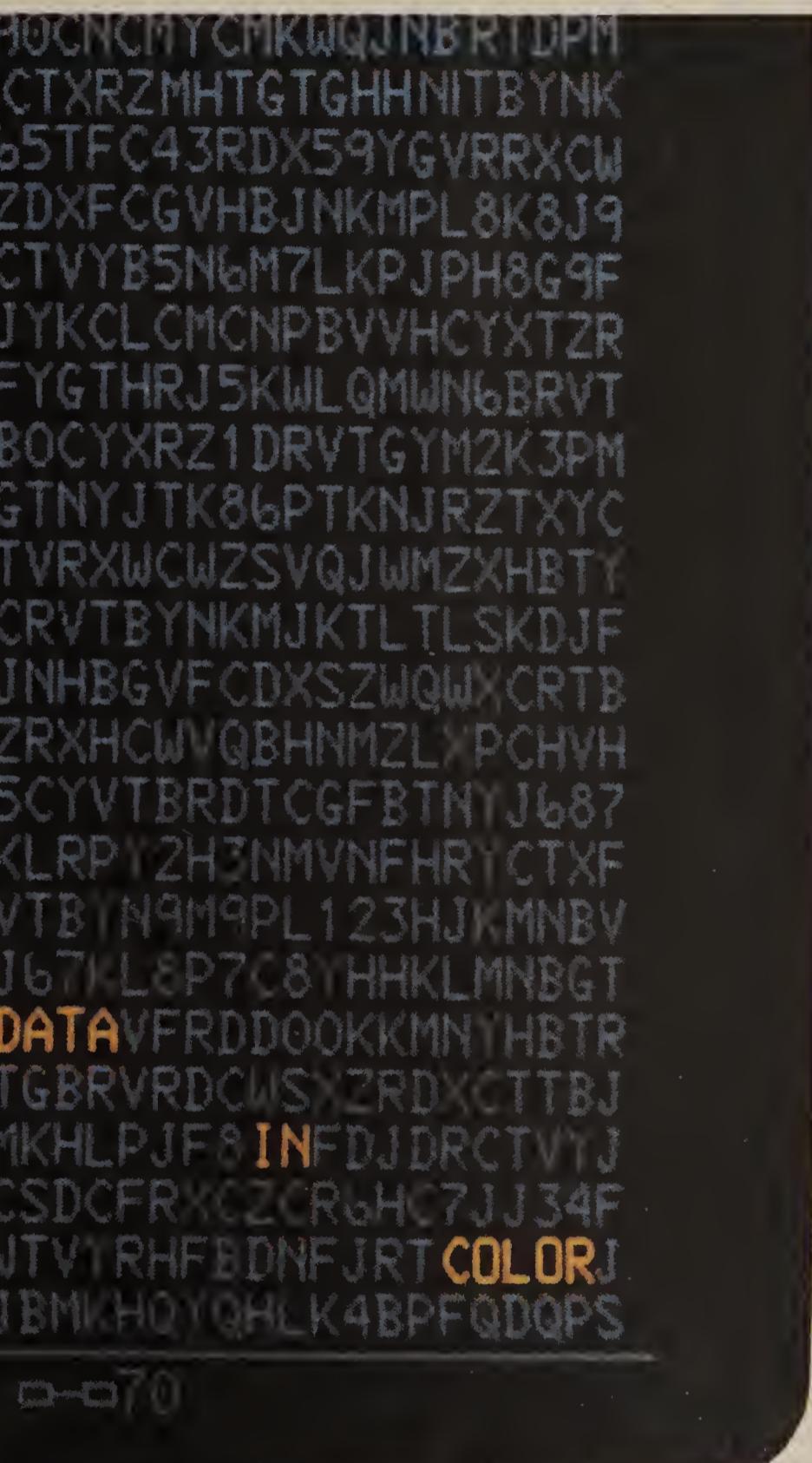
Changing circumstances, such as the Paradyne suspension and pending litigation, warrant a new evaluation of the need to purchase Paradyne equipment, the GAO concluded.

Paradyne's suspension was triggered by criminal charges alleging that the firm won a \$118 million contract for data communications equipment and terminals by misleading Social Security Administration officials as to the status and availability of the products.

At a key demonstration test, Paradyne used a Digital Equipment Corp. PDP-11 processor instead of the Paradyne P-8400 processor promised in the bid and covered the label with a Paradyne label without informing agency officials.

The Department of Justice earlier this month filed a civil suit against Paradyne to recover profits the firm obtained under that contract.

The Justice department plans to delay the civil proceeding until after the criminal trial.



70

were easier to catch.

Soon, REJIS end users everywhere wanted IBM 3179 Color Displays. The result — IBM color displays are now being placed throughout the REJIS network.

Whether you have a small departmental system or a large computer, there's a range of IBM color displays

and color graphic displays that could help enhance your network's efficiency.

For your free demonstration diskette, "Why Color," call 1 800 IBM-2468, Ext. BT/90. Or contact your IBM marketing representative.

Call today.



COMPUTER INDUSTRY

Nixdorf ignites overseas vendors' hopes to enter U.S. market

W. German company scores retail contract

By Dennis Phillips
Computerworld International News Service

BONN — The recent signing of a \$100 million contract between West Germany's Nixdorf Computer AG and a 400-store U.S. retail chain, reportedly Montgomery Ward & Co., may help open the door to the North American market for European software companies, industry analysts predict.

The very competitive price war for both hardware and standard software programs in the U.S. had many

analysts fearing just the opposite trend. They expected U.S. companies would invade the European market. But now Nixdorf's success in winning a big contract "in the lion's den" gives European firms cause for optimism.

Top quality software, an installed service network and a cutthroat price combined to help Nixdorf grab the more than \$100 million contract with the U.S. retail chain, according to insiders.

"From the hardware side, there's no reason to buy from Nixdorf," says a banking analyst, who asked to remain anonymous. "So if it's true they won the contract for their software, that puts a new light on things. May-

be European companies, and especially German ones, will have a greater impact in the U.S. now."

Nixdorf's software department now offers about 130 software programs, mostly developed in-house, for different applications.

'A complete solution'

"I think the European companies may have a competitive advantage as they offer a complete solution — hardware, software and service," says Hans-Joachim Grobe, consultant with management consultants Dieboldt Deutschland GmbH in Frankfurt.

While traditionally strong in the European and Asian banking sector,

Nixdorf also installed a new retail point-of-sale (POS) program in Australia recently. The 45-store Myer retail chain in Australia ordered 2,250 POS terminals from Nixdorf at the end of 1985, according to Nixdorf spokesman Rolf Prey.

Developing the software for that system undoubtedly helped the West German firm in its bid for the U.S. contract. If the U.S. chain, like the Australian retailer, wants 50 terminals per store, it will require 20,000 POS terminals. Installation in the U.S. is to start in 1987.

Considering the downstream advantages for Nixdorf, the sales price was probably set with no profit margin at all, analysts suggest. Nixdorf confirms that the contract is split 50% for hardware and 50% for software and services.

Until now, Nixdorf has lost money in the U.S., investing heavily to set up its own sales and service offices in 100 U.S. cities [CW, July 7]. "We needed to get a customer to use this system, but without such a technical support system you can't win a major contract," Prey says. "First we had to invest. Now it will start to earn money in America."

ON OCTOBER 8, WE FOCUS ON OFFICE AUTOMATION

It doesn't take a lot of insight to recognize that office automation has changed radically over the last 15 years. Typewriters are rapidly becoming obsolete. Telecopiers are being replaced by modems. Laser technology is finding its way into the front office.

In October's Computerworld Focus, we'll offer information on planning, product selection, technology alternatives and system implementation plans from expert users and industry analysts.

We'll look into the future to see what's in store. And we won't just look at products, but vendors, too. Complete with Inside Information on their evolving product paths.

Then we'll zero in on the information center.

Within the automated office the concept of the information center is paying dividends. In October, our special section will examine the IC's changing role, and the new ways MIS/DP professionals and end users are working together toward the productivity increase goal. We'll talk with an info-center manager for a firsthand view of the new functions the IC is providing. And finally, we'll profile some major IC sites, their functions and technologies.

Reach the people you really want.

The people we'll reach are the people you want most: 128,000 paid Computerworld subscribers. Plus thousands of pass-along readers. And thousands more attending Info '86.

So if office automation is your business, you can reach your audience effectively — and efficiently in the October 8 Issue of Focus.

But hurry, closing is August 29.

For more information, contact Ed Marecki, Vice President/Sales, Computerworld Focus, 375 Cochituate Rd., Framingham, MA 01701-9171, (617) 879-0700. Or call your local Computerworld sales representative.

Issue: October 8 - Closing: August 29

COMPUTERWORLD FOCUS

We put the hottest issues of the day in focus.

SALES OFFICES: Boston: (617) 879-0700; New York: (212) 967-1350; Atlanta: (404) 394-0758; Chicago: (312) 827-4433; Dallas: (214) 991-8366; San Francisco: (415) 421-7330; Los Angeles: (714) 261-1230.

A PUBLICATION OF
CW COMMUNICATIONS

Harris broadens CAD packages via acquisition

By Alan Alper

NEW YORK — Harris Corp. last week announced the acquisition of Scientific Calculations, Inc., a Fishers, N.Y.-based developer of electrical computer-aided design (CAD) software.

Harris said it acquired the privately held Scientific Calculations, which has sales of about \$30 million, to broaden its portfolio of mechanical CAD products to include electrical CAD packages for the design of printed circuit boards and integrated circuits. Scientific Calculations' SCI-CADs printed circuit board design package is said to be used by approximately 70% of leading electronics firms, according to Harris.

James Oyler, senior vice-president of Harris's Information Systems sector, said the acquisition would enable the Melbourne, Fla., firm to become the only vendor offering its own range of mechanical and electrical CAD software packages.

"Users are beginning to need packages from various disciplines," Oyler said. "And, over time, demand will increase."

Scientific Calculations is essentially a software developer, but also markets turnkey, electrical CAD systems based on Digital Equipment Corp. hardware.

Oyler said Scientific Calculations will retain its name and operate under current management, led by President Paul Watkins.

The company will be part of Harris's Information Systems unit. Eventually, however, Scientific Calculations' sales, marketing and product development will be merged into the sector, he added.

If the space program had advanced as fast as the computer industry, this might be the view from your office.

And space stations, Martian colonies, and interstellar probes might already be commonplace. Does that sound outlandish? Then bear these facts in mind:

In 1946 ENIAC was the scientific marvel of the day. This computer weighed 30 tons, stood two stories high, covered 15,000 square feet, and cost \$486,840.22 in 1946 dollars. Today a \$2,000 portable can add and subtract more than 20 times faster. And, by 1990, the average digital watch will have as much computing power as ENIAC.

The collective brainpower of computers sold in the next two years will equal that of all computers sold from the beginning to now. Four years from now it will have doubled again.

It's hard to remember that this is scientific fact, not fiction. How do people keep pace with

change like this? That's where we come in. We're CW Communications/Inc. — the world's largest publisher of computer-related newspapers and magazines.

Every month more than 10,000,000 people read one or more of our publications.

Nobody reaches more computer-involved people around the world than we do. And nobody covers as many markets. In the United States we publish three computer/business journals. *Micro Marketworld* is published 24 times a year for businesses reselling small computer systems and software. *Network World* is the first and only newsweekly for users of data, voice and video communications products and services. And *Computerworld*, the newsweekly for the computer community, is the largest specialized business publication of any kind in this country.



We also offer seven personal computer publications. *InfoWorld*, the weekly newspaper for people managing and purchasing personal computers for American business. The other six concentrate on specific personal computers: *PC World*, the comprehensive guide to IBM personal computers and compatibles; *inCider*, the Apple II journal; *Macworld*, the Macintosh magazine; *80 Micro*, the magazine for TRS-80 users; *RUN*, the Commodore 64 & VIC-20 magazine; and *AmigaWorld*, the magazine for the Commodore Amiga.

And we have similar publications in every major computer market in the world. Our network publishes over 60 computer publications in more than 25 countries — Argentina, Australia, Austria, Brazil, Chile, Denmark, Finland, France, Greece, Hong Kong, Hungary, India, Israel, Italy, Japan, Mexico,

The Netherlands, Norway, People's Republic of China, Saudi Arabia, Singapore, South Korea, Spain, Sweden, Switzerland, United Kingdom, United States, Venezuela, and West Germany.

**The sooner we hear from you,
the sooner you'll hear from our readers**

Simply put, we make it easy for you to reach your target audience — and for them to reach you. Call today for more information. You'll find the number below.



CW COMMUNICATIONS/INC.

375 Cochituate Road, Box 9171
Framingham, MA 01701-9171 (617) 879-0700

BUY - SELL - SWAP

Who do you call on first for your data processing and telecommunications needs?

CMI SPECIALISTS

**3081, 3083
3084
FOR SALE
OR LEASE**

**DEC
VAX 8200, 8300, 8600
8650, 8800
PURCHASE LEASEBACK**

REGIONAL OFFICES
Laguna Hills, CA (714) 951-3200
Tampa, FL (813) 228-7000

LOCAL OFFICES
Absecon, NJ (609) 645-7282
Atlanta, GA (404) 256-7942
Boston, MA (617) 367-5755
Chicago, IL (312) 620-4400
Cleveland, OH (216) 292-8242

Dallas, TX (214) 869-3111
Encino, CA (818) 789-0113
Flemington, NJ (201) 782-3878
Houston, TX (713) 780-7459
Lebanon, TN (615) 449-6633
Miami, FL (305) 442-2968
Oceanport, NJ (201) 542-6776
Sacramento, CA (916) 443-7511

INTERNATIONAL OFFICES
Frankfurt, West Germany
Telex: 4170499
London, England Telex: 848980
Montreal, Quebec (514) 871-1121
Nyon, Switzerland Telex: 27209
Paris, France Telex: 214093
Toronto, Ontario (416) 928-3400
Vancouver, British Columbia
(604) 685-6196

CMI CMI Corporation
CMI Financial Services Group
Headquarters
2600 Telegraph Rd./P.O. Box 2026, Bloomfield Hills, MI 48303-2026
(313) 456-0000/TWX 810-232-1667 CMI CORP. BDHS

Member ASCD and CDLA

IBM BUY · SELL · LEASE



- Processors
- Peripherals
- Upgrades

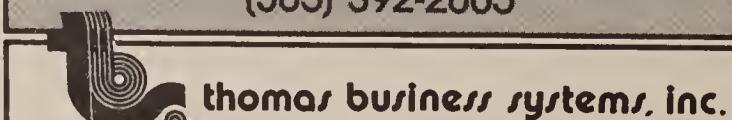
DEMPEY ASSOCIATES

18377 Beach Blvd. Suite 323 • Huntington Beach, CA 92648 (714) 847-8486

Buy • Sell • Trade

IBM • DG • DEC

(305) 392-2005



4301 OAK CIRCLE • UNIT 11 • BOCA RATON, FL 33431

no

NO DELAYS
NO INSTALLATION PROBLEMS
NO WORRIES
NO MIDDLEMEN
NO GUESSING
NO DISAPPOINTMENTS

WE BUY · SELL · LEASE
34 · 36 · 38 · SERIES 1 · 4331-4381
ALL PERIPHERAL EQUIPMENT
ALL UPGRADES
SOFTWARE & DATA COMMUNICATIONS CONSULTING

CALL: 800-238-6405
IN TN: 901-372-2622
IN NC: 919-884-0879



COMPUTER BROKERS INC.
2978 SHELBY ST.
MEMPHIS, TN 38134
“SINCE 1974”



We Buy & Sell

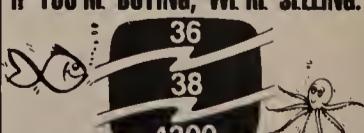
DEC

Systems
Components

call: 713
445-0082

600 Kenrick Ste C22
Houston, Tx 77060

IF YOU'RE BUYING, WE'RE SELLING.



IF YOU'RE SELLING, WE'RE BUYING.

IBM SYSTEMS Buy · Sell · Lease PERIPHERALS

(800) 331-8283

TOLL FREE

(213) 306-9343

CALIFORNIA

Ocean Computers, Inc.
8055 W. Manchester Ave., Ste 525
Playa Del Rey, CA 90293

BUY SELL SWAP

**Providing
the BEST
a BETTER
WAY.**



BUY·SELL·LEASE S/34·S/36·S/38 43XX·30XX SERIES/1 NEW OR USED

WE OFFER...

- PLUG COMPATIBLES • OEM
- COMMUNICATIONS EQUIPMENT
- AT&T® • BURROUGHS®
- XEROX® PLUS...
- COMPLETE FINANCIAL SERVICES
- ECONOCOM CONTINGENCY SERVICES (DISASTER RECOVERY PLANNING AND RECOVERY CENTERS FOR S/34-S/36-S/38)
- MANAGEMENT CONSULTING SERVICES

- THE ECONOCOM LINE OF PLUG COMPATIBLES
- SERVICE PLUS FROM ECONOCOM MAINTENANCE COMPANY
- PROFESSIONAL SERVICE
- COMPETITIVE PRICING
- FLEXIBLE FINANCING
- QUICK DELIVERY
- SHORT TERM LEASING
- LONG TERM LEASING
- PERIPHERAL LEASING
- TRADE-INS ACCEPTED
- TAKE-OUTS DONE
- MAINTENANCE GUARANTEE

ATLANTA (404) 399-0732	DALLAS (214) 751-0100	LOS ANGELES (714) 852-0831	NORFOLK (804) 490-7831
BIRMINGHAM (205) 823-6568	DENVER (303) 893-1511	LOUISVILLE (502) 589-1376	OKLAHOMA CITY (405) 848-3981
BOULDER (303) 449-1958	HOUSTON (713) 789-0800	MEMPHIS (901) 767-9130	ORLANDO (305) 767-9416
CHARLOTTE (704) 523-5508	KANSAS CITY (800) 238-3098	MIAMI (305) 755-4949	RALEIGH (919) 544-6305
CHATTANOOGA (615) 624-0976	LITTLE ROCK (501) 224-6242	NASHVILLE (615) 386-7019	TULSA (918) 493-5015

IN ADDITION, THE ECONOCOM CORPORATION HAS 31 OFFICES THROUGHOUT EUROPE.

ECONOCOM-USA, INC.

845 CROSSOVER LANE • MEMPHIS, TN 38117

800-238-3098
OR 901-767-9130



IBM UNIT RECORD EQUIPMENT DISK PACKS—DATA MODULES—MAG.TAPE—DISKETTES



SALE OR LEASE

IBM UNIT RECORD MACHINES
026-029-082-083-084
085-087-088-129-514
519-548-557-188

NEW & USED
DISK PACKS—DATA MODULES
2316—3336(1)—3336(11)—3348(70)
MAG. TAPE-DISKETTES
Every Item Guaranteed

Highest Prices Paid for Used Packs & Modules

THOMAS COMPUTER CORPORATION
5633 W. Howard St.
Chicago, IL 60648
(IL-312-647-0880)

LEAS PAK INTERNATIONAL
BEST PRICE
BEST SERVICE
BEST DELIVERY

WHETHER YOU BUY, SELL, OR LEASE

PRINTERS
AND
CRT'S

S/34
AND
S/38

SYSTEM 36 PROCESSORS
DISK AND
UPGRADES

LARGE
INVENTORY

LEASE
FINANCING

LEAS PAK INTERNATIONAL™
ONE SOURCE SOLUTION
2120 Forum Parkway, Bedford, TX 76021 Phone 817-267-2841
1-800-LEAS-PAK (In Texas: 1-800-722-7811)

Greyhound Capital Corporation

A subsidiary of The Greyhound Corporation



© 1986 Greyhound Capital Corporation

GREAT DEALS ON **3380 AA4s or BO4s**

COMPETITIVE SALES/LEASE PRICES
CALL NOW!...TOLL-FREE!



Sales Offices in:
Atlanta, Austin, Boston, Chicago, Dallas, Houston, Los Angeles, Minneapolis, New York,
Philadelphia, Phoenix, Pittsburgh, San Francisco.



Inflation Fighters

Quality & Savings

Slightly used. Money Back Guarantee. Full Reels. All External Labels Removed. Guaranteed for use at 1600 BPI through 6250 BPI.

2400' Reel \$4.95 ea.
1200' Reel \$4.50 ea.
600' Reel \$3.75 ea.

All Tapes with Hanging Seals

E-Z II's... add 50¢
Order 200 tapes — FREE E-Z II's
We pay freight on orders over 200 tapes.

Call or Write

Computer Tape Mart
44A Seabro Avenue
N. Amityville, New York 11701
[516] 842-8512

St. Johnsbury Trucking Company
Honeywell DPS 8/70 System
Available for Sub-lease

December 1986 to August 1988

Owner willing to negotiate follow-on agreement

HONEYWELL MAINFRAME

TANDEM DPS 8/70 SYSTEM
(2-CPU's, 2-SCU's, 2-IOM's)

features:

"HIGH BOY" STYLE CABINETRY

CURRENTLY RUNNING GCOS/8 SR2300

2-CONSOLES INCLUDING SYSTEM CONTROL CENTER
2-EMBEDDED URP'S
16MB (M128 STYLE MEMORY)

HONEYWELL'S CURRENT LIST PRICE ON THIS EQUIPMENT IS
\$1,638,000

St. Johnsbury is upgrading to a DPS/88

Any Reasonable Offer Will Be Considered

For Information Contact:

Richard H. Pulifer
Data Center Administrator
St. Johnsbury Trucking Company
38 Main St., St. Johnsbury, Vermont 05819
(802) 748-5091

Sale Or Lease

3890-B04

Loaded With Features

Call Ext. 401
(800) 821-0229
(818) 986-2411
In California,
El Camino Resources

For Sale or Lease

IBM S/36

- Available Immediately
- Eligible for IBM Maintenance
- Affordable Monthly Lease Payments

CALL NOW
Elizabeth 617/267-2900
Boston Financial
& Equity Corporation
21 Burlington Avenue
Boston, MA. 02215

SAVE!

USED IBM

S/36

XL datacomp INC.

Model B-23

**Available
Immediately**

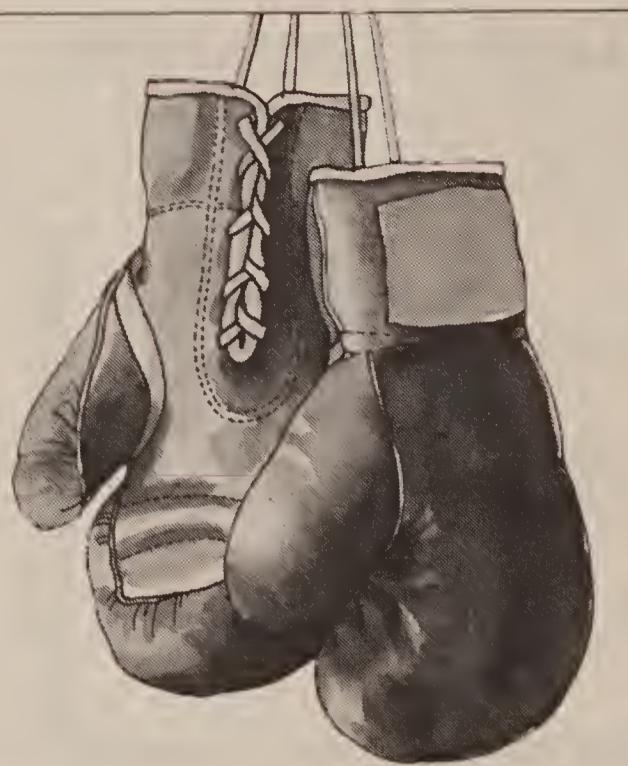
**IBM
Maintenance
Guaranteed**

**Call
Bill Quinn
312/
371-5523**

BUY SELL SWAP

BUY SELL SWAP

COMPUTERWORLD



HARDWEAR FOR SALE

Right now, Codex offers a handful of remanufactured modems warrantied to withstand the wear and tear of a second round. Products on par with the same Codex modems users rate #1 for reliability, quality and price/performance value year after year.

Best of all, these champion boxes are available at knock-out prices. Ready for quick delivery for a limited time only. Call 1-800-446-6336 to order directly. Don't delay. It's a hard hitting deal you'd be soft to miss out on.

Product Code	Statistical Multiplexers	Description	Price
# 66841	Codex 6040R async/sync	16 terminal ports, 2 network ports	\$4800
# 66843	Codex 6040R async/sync	24 terminal ports, 2 network ports	\$5400
# 66012	Codex 6010 async	16 terminal ports, 1 network port	\$3000
# 66013	Codex 6010 async	24 terminal ports, 1 network port	\$4200
# 66014	Codex 6010 async	30 terminal ports, 1 network port	\$5100
Time Division Multiplexers			
# 32604	Codex 604 sync	4 terminal ports up to 19.2 kbps	\$450
Network Control Modems			
# 14404	SP 14.4 Standalone	14,400 bps	\$2300
# 14424	SP 14.4 Standalone with 6 channel mux	14,400 bps	\$2750
# 23504	CS 4800 Point-to-Point with 4 channel mux	4800 bps	\$2400
# 23502	CS 9600 Point-to-Point with 4 channel mux	9600 bps	\$3250
# 23505	CS 4800 Fast Poll	Multipoint	\$2045
# 23503	CS 9600 Fast Poll	Multipoint	\$2895

Codex


IBM SPECIALISTS

SELL • LEASE • BUY
\$/34 \$/36 \$/38
3741 3742

- New and Used
- All Peripherals
- Upgrades and Features
- IBM Maintenance Guaranteed
- Immediate Delivery
- Completely Refurbished

800-251-2670
IN TENNESSEE (615) 847-4031

ASCD
MEMBER
AMERICAN
SOCIETY OF
COMPUTER
DEALERS

CMA
COMPUTER MARKETING
of America, Inc.

P O BOX 71 • 610 BRYAN STREET • OLD HICKORY, TENNESSEE 37138

BUY SELL SWAP

MISSISSIPPI CENTRAL DATA PROCESSING AUTHORITY

Sealed proposals will be received by the CCPA, 301 N. Lamar St., 301 Building, Suite 508, Jackson, MS 39201 for the following equipment and services:

Request for Proposal No. 1132, due Tuesday, September 9, 1986 at 3:30 p.m. for the upgrade of an existing Atlanta Research Technical Control facility for the data communications network at the STATE COMPUTER CENTER.

Request for Proposal No. 1133, due Tuesday, September 23, 1986 at 3:30 p.m. for the acquisition of a Pharmacy System for the UNIVERSITY MEDICAL CENTER to be installed on an IBM 4381 running MVS/SP and CICS 1.6.1. Vendors must attend a mandatory bidders conference Thursday, September 4, 1986 at 2:00 p.m. in the Computer Services Office of the University Medical Center, 2500 North State Street, Jackson, MS 39216.

Request for Proposal No. 1134, due Tuesday, September 16, 1986 at 3:30 p.m. for the acquisition of a multiprogramming minicomputer based system to function as a distributed processor to the State Computer Center for the MISSISSIPPI STATE PERSONNEL BOARD.

Request for Proposal No. 1135, due Monday, September 15, 1986 at 3:30 p.m. for the acquisition of an upgrade for an Amdahl 5868 to a 5880, or compatible system for the STATE COMPUTER CENTER.

Request for Proposal No. 1136, due Monday, September 15, 1986 at 3:30 p.m. for a communications front-end processor for the STATE COMPUTER CENTER.

Request for Proposal No. 1137, due Tuesday, September 16, 1986 at 3:30 p.m. for the upgrade of a 3380 technology disk subsystem for the STATE COMPUTER CENTER.

Request for Proposal No. 1138, due Tuesday, September 16, 1986 at 3:30 p.m. for the upgrade of 3420 technology tape drives for the STATE COMPUTER CENTER.

Detailed specifications may be obtained from the CCPA office. The CCPA reserves the right to reject any and all bids and proposals and to waive informality.

Lisa Winstead @ (601) 359-2625 or
Colleen Downing @ (601) 359-2624

★ Buy ★ Sell ★ Lease ★ Rent
IBM. Displaywriters

5525 — OFFICE SYSTEMS
5219 — 5253 — 5258

6670 PRINTERS
SYSTEM/34/36

Up to 50% SAVINGS on
FACTORY RECONDITIONED

WANG

WPS • OIS • VS Equipment
All equipment is covered by
the Wang Service Contract
Authorized Wang
Used Equipment Dealer

CDB FINANCIAL, INC.

3520 DILIDO ROAD
DALLAS, TEXAS 75228
7-POINTS SALES OFFICE
214-432-3810 Member: CDLA-NOMDA

IBM PROCESSOR

3083-B16 X 16
PROCESSOR

AVAILABLE FOR SALE

SEPTEMBER 1, 1986

CALL DALE HAUGER

MAJOR COMPUTER
INCORPORATED
612/933-6000

• WILL RECONFIGURE MEMORY &
CHANNELS TO FIT YOUR NEEDS.



For Sale

3081KX 4x24 CPU

Available Immediately

Serial # 23243

ECR Owned

Call Ext. 401

(800) 821-0229

(818) 986-2411

In California

El Camino Resources

BUY SELL SWAP

Rentals Month To Month

Terminals 3193, 3178

Terminal Controller

3174 1L

* Available Aug 15 *

Call For Rates

Call Ext. 401

(800) 821-0229

(818) 986-2411

In California

El Camino Resources

BUY SELL SWAP

3704

3705 3725

BUY • SELL • LEASE

Call Toll-Free

800 532-7532

In Minnesota Call 612/944-9161

Centron DPL Company
Member CDLA

S/34 • S/36 • S/38
S/23 • 4300 • POS

AMCOM

CORPORATION

5200 W 73RD ST

MINNEAPOLIS, MN 55435

612-835-4737 800-328-7723

FOR SALE

3270 Compatible

Color CRT's

AT&T E4549 (IBM 3279-S2A)

Delivery: Immediate

Price \$999

Quantity: 500+

Controllers Available

Terms Negotiable

AT&T E 4540

(3274-C41 Compatible)

Call Chuck 212 682-9330

FOR SALE

2 Eastman Kodak Oracle
Microfilmers 16mm

Accommodates 215-foot rolls of thin based film. Reduces up to 11 by 14" in size.

Call Rick
at IDG
(617) 875-5000
(ext 452)

ORDER FORM

Issue Date: Ad closing is every Friday, 10 days prior to issue date.

Sections: Please be sure to specify the section you want: Micro Direct Shopper, Time and Services, Software for Sale, Position Announcements and Buy/Sell/Swap. (Available upon request: Software Wanted, Real Estate, and others).

Copy: We'll typeset your ad at no extra charge. Please attach CLEAN typewritten copy. Figure about 25 words to a column inch, not including headlines. Any special artwork should be enclosed with your ad also. Logos must be submitted on white bond paper for best reproduction.

Cost: Our rates are \$161.70 per column inch. (Each column is 1 13/16") Minimum size is two column inches (1 13/16" wide by 2" deep) and costs \$323.40 per insertion. Extra space is available in half-inch increments and costs \$80.85. Box numbers are \$15.00 extra per insertion.

Billing: If you're a first-time advertiser, (or if you have not established an account with us.) WE MUST HAVE YOUR PAYMENT IN ADVANCE, or a Purchase Order Number. Any extensions on this policy must be made through our Credit Department.

Ad size desired:

columns wide by inches deep.

Issue Date(s):

Section:

Name:

Company:

Address:

Telephone:

Send this form to:

**COMPUTERWORLD
CLASSIFIED ADVERTISING**

375 Cochituate Road
Box 9171
Framingham, MA 01701-9171

The Bulletin Board

Buy • Sell • Lease

QANTEL**BUY SELL LEASE****QANTEL/NEC**

CALL PROMPT COMPUTER

Dan Kobia
(216) 248-2898**MISC.
SYSTEMS**

FOR SALE
 Large Selection of Used
 Ultimate Computer Systems
 2020's, 1510's, 1500's
 Some peripherals available
 Job Training Partnership Office
 800 Capitol Mall, MIC 69
 Sacramento, CA 95814
 916-322-8988
 Ask for Gia

DEC**DEC
SUMMER SIZZLERS**

11/44 CPU Set KD112	....\$3,900
HSC5X-CA	.....\$5,700
KU785 WCS	....\$3,700
MF20-M	....\$4,400
MS630-BA	....\$1,500
MS630-BB	....\$2,100
MS750-CA	....\$1,200
MSV11-QC	....\$1,250
MS11-LD	....\$375
MSV11-PL	....\$540
VAX 730 CPU KIT	....\$4,400
VAX 750 CPU KIT	....\$8,900
VAX 4MB MS780-JD	....\$3,400
VAX 4MB MS86-BA	....\$8,600

QEI, Inc. (617) 275-6800
 (800)-331-6140 (504) 641-6140

DEC NEW & USED**BUY - SELL - EXCHANGE**

Systems • Processors • Memory

Options • Peripherals • Modules

LAKEWOOD COMPUTER CORP.

436 Link Lane
 Ft. Collins, CO 80524
 (303) 493-6406**DEC****DEC FINANCING
8000's and MV's**Super Rates
 All Terms and Structures
 TSS FINANCIAL
 Jeff Sturm (415) 283-2915

BUY • SELL • TRADE
 Planning to buy non-DEC memory?
 Check our DEC memory prices first!
 1124-AA DZ11-DP MS11-PB
 BC26V-50 H9642-AP MSV11-PL
 BC27V-80 H9642-CA MS750-CA
 DLV11-J KDF11-AA MSV1-JC
 NEW YORK COMPUTER EXCHANGE
 (516)752-8666 (800)645-9109

PRIME**FOR SALE**

Prime I450-II Model #I45-17N
 2 Meg Memory
 48 Port Controllers
 160 MB Fixed Disc Drive
 300 MB Removable Drive
 800/1600 Tape Drive
 Deinstalled -- Make Offer

Colwell Industries123 N. 3rd Street
 Minneapolis, MN 55401
 Rick Schoen

LARGE SELECTION OF USED
 PRIME COMPUTER SYSTEMS
 ...SAVINGS TO 50%
 Peripherals also available
 1st SOLUTIONS, INC.
 2001 EAST CAMPBELL AVE.
 PHOENIX, ARIZONA 85016
 (602) 957-0999
 ASK FOR DON OR MATT

PRIME**5 PRIME 9955 SYSTEMS**

Loads of Memory, Peripherals, Controllers, Communications, Terminals, Port Selectors, Multiplexers, Modems. Prime equipment certified maintainable Available September/October
 1st Solutions, Inc.
 Don Shifris
 (602) 957-0999

FOR SALE**USED
PRIME 650 SYSTEM**

\$35,000 or Best Offer
 (312) 870-8707
 Ask for Tony

PRIME 675 mb disks
 \$12,950 (overstocked)
 NEW (same as 4491)
 SYSTEM TECHNOLOGY
 ASSOCIATES
 Sales & Service Nationwide
 (713) 440-8340
 (800) 553-5124

**HEWLETT
PACKARD****HP 3000 • 1000****9000 and now 250**

Buy & Sell Worldwide
ENCORE
 (213) 452-9117
 Telex 756927

MODEMS**CODEX**

At Unbelievable Prices

All Models

CS48FP \$1,250.
 Ocean Computers
 Chuck 213-306-9343
 Or 1-800-331-8283

IBM**PRINT TRAINS**

IBM 1416 & 3216
 Bought - Sold - Lease
 Repaired - Reconditioned
**COMPU-ACT
COMPANY, INC.**
 (813) 863-2461

S/34 . S/36 . S/38

Upgrades/Peripherals

Lowest Price

Call Collect (404) 475-7507
Datamarc Computer Sales
 785 Branch Dr, Alpharetta, GA 30201

• TALK CHEAP TO MAINFRAMES •

ATTACH PC./ASYNCN
 LOCAL OR REMOTE
 Replace 3274 SNA/SDLC
 ... At 20% Of Cost!
 (Synchronous Modems
 Also Available At A Steal)
 DGC Inc.,
 1450 Preston Forest Square,
 Dallas, TX 75230 (214) 991-4044

SERIES/1**BUY - SELL - LEASE**

New, Used, CDC, Features
Xerxes Computer Sales
 800/328-3884 612/936-9280

IBM**SERIES 1****BUY SELL LEASE**

Newport Leasing, Inc.
 Call Don
 (714) 770-2122

S/38

Mod 5, Mod 8, Mod 18
 Immediate Availability
 Must Sell Or Lease
 Source Data Products
 800/328-2669 415/326-7333
 Call Bob Losey

SELL/LEASE**S/36**

Model B or C
 With or Without Peripherals
 Call Louis Felder (914) 238-9631
 Computer Merchants Inc.

34-36-38

Systems,
 Peripherals & Upgrades
 Guaranteed Quality Service
 Special Reduced Prices
 New and Used Equipment
Carlyn Computer Systems, Inc.
 800-828-4227
 In VA (703) 642-1950

FOR SALE BY OWNER

Entire DP Shop Disolved
 • IBM 4341 * Air Conditioners
 • IBM 3278's * Data Safe
 • IBM 3279 * Carpeted Flooring
 • Power Conditioner ... And More!!
 Everything Will Be Sold!
 Avail: Sept 15th All Bids By: Sept 1st
 Call Monty Points (405) 272-9201

SALE/LEASE**S/38-18**

With 8 MB And Peripherals
 As Required
 Call Ron Gibb (914) 238-9631
 Computer Merchants Inc.

STC 4534

Tape Drives

End user wants to buy 1 or 2
 Call Ron Domnauer
 (617) 482-6245, ext. 271

For Sale/Lease**4341-M02**

And
3380-A&B Drives
 Call Jerry (612) 835-7230

3179 \$1,400

3287-2 \$2,000

1442-N1 \$700

Digitex Corporation
 (813) 251-2889

4361, 4381

All Models Available

Call Russ Schneider
 800/426-4341
 In CA 408/241-3677
Marketex Computer Corp.

Want To Buy**System 38****System 36**

(713) 627-7117

S/36**Rentals Available**

(713) 627-7117

(212) 279-4467

IBM**FOR SALE**

2 IBM 3864 MODEMS, Model 1
 4800BPS non-switched.
 \$1,800 Each
 Call Debbie Powell
 Jacore Systems
 (404) 952-9400

S/38 S/36 S/34**SERIES 1**

BUY - SELL - LEASE
 Systems, Peripherals & Upgrades
 Source Data Products
 800/328-2669 415/326-7333

3180**3178, 3179,
3278, 3274**

All Other IBM Units Available
 Call Penny 800/426-4341
 In CA 408/241-3677
Marketex Computer Corp.

SELL/LEASE**5256-3****PRINTERS**

Refurbished
 Available Now
 Call Bill Hegan (914) 238-9631
 Computer Merchants Inc.

FOR SALE**IBM SYSTEM/38 MODEL 18 with:**

(2) 3370 Storage Devices
 (1) 3411 Magnetic Tape Device
 (1) 5224 Dot-Matrix Printer
 (10) 5291 Workstations

Call Bill Martin
 (317) 668-7535**DATA
GENERAL****NPA SYSTEMS INC.**

for the SALE, LEASE,
 PURCHASE & SERVICE OF
 DATA GENERAL EQUIPMENT

CALL
 (516) 467-2500 (415) 848-9835
 (NEW YORK) (CALIFORNIA)

DISASTER PLAN & FACILITY
 MANAGEMENT ALSO AVAILABLE**BUY IN CANADA
WHERE YOUR U.S.****DOLLARS GO FURTHER**

Systems and Peripherals
 Buy and Sell Worldwide
 Norcomex, Ltd
 800-387-3613 (From U.S. Only)
 416-738-0803 or 416-736-1059
 Telex # 0698676 TOR

BUY - SELL**MVP/LVP • OIS • VS • PC****SYSTEMS IN INVENTORY****VS-45 • OIS • VS-100****GENESIS****EQUIPMENT MARKETING****GEM****(602) 277-8230****HOLSON ASSOCIATES, INC.**Authorized
 Wang Used Equipment Dealers

Buy and Sell

Guaranteed For Wang Maintenance

2470 Windy Hill Road, Suite 253

Marietta, GA 30067

Call: Richard Holley or Carole Benson

(404) 980-1700

WANG**VS**

SOFTWARE FOR SALE

SOFTWARE CONVERSION SOLUTIONS

Dataware provides the software translation system for your complex conversion problems. Over 18 years of conversion experience has resulted in thousands of satisfied customers worldwide.

- COBOL to COBOL
- AUTOCODER/SPS to COBOL
- EASYCODER/TRAN to COBOL
- BAL/ALC to COBOL
- FORTRAN to FORTRAN
- PL/I to COBOL
- RPG/RPG II to COBOL
- RPG/RPG II to PL/I
- DOS to MVS

Dataware offers services & software to meet your needs. For more information, call or write today.

The Conversion Software People
Dataware, Inc.
A Computer Task Group Company

3095 Union Road
Orchard Park, NY 14217-1214
Phone: (800) 367-2687
TELEX: 510-100-2155



GENIX-REMOTE COMPUTING SERVICES

NO CONNECT TIME CHARGE

Highest Quality IBM Remote Computing at Best Possible Prices

- MVS SP1.3
- VM • DOS
- CICS • CMS
- FCO • IMS DB/DC
- ROSCOE
- TSO ISPF • VSPC
- MILLENIUM
- FOCUS, SAS
- MICRO/MAIN-FRAME LINK
- MANTIS
- Capacity Planning
- Complete Application Development Tools

We are a Customer Service Oriented Company with Offices in:

- Atlanta
- Denver
- Philadelphia
- Pittsburgh
- Washington, D.C.

GENIX Corporation
20 Stanwix Street
Pittsburgh, PA 15222
1-800-874-3649

GENIX

DATA CENTER SERVICES

- ★ MILLENIUM
- ★ OS/MVS/SP
- ★ VM/370
- ★ DOS/VSE/SCP
- ★ CMS
- ★ NOMAD2
- ★ TSO/SPF
- ★ CICS
- ★ IMS/DBDC
- ★ RJE
- ★ TELENET ACCESS

Info Center Products
Access By Micros
EXCELLENT SERVICE LEVELS
COMPETITIVE RATES
VOLUME DISCOUNTS

BURNS COMPUTING SERVICES, INC.

MIDWEST: 312/981-5260
EAST COAST: 215/398-3600
212/432-1151
MILLENIUM is a registered trademark of McCormack & Dodge
NOMAD2 is a trademark of DEB COMPUTING SERVICES INC

DEC SPECIALISTS VAX 8600 & PDP-11 TIME SHARING

NO CPU CHARGES
\$7 / \$10

RSTS/E VMS
PER HOUR CONNECT TIME
BUDGET BYTES®
212-944-9230 EXT. 110
TIMESHARING
GENERAL CONSULTING
SOFTWARE DEVELOPMENT
FACILITIES MANAGEMENT
COMPUTER EQUIPMENT & SUPPLIES
HARDWARE MAINTENANCE (NY METRO AREA)
MEDIA CONVERSION
EXECUTIVE SEARCH
SOLOMON ACCOUNTING SOFTWARE
Omnicomputer, Inc.
1430 Broadway, New York, N.Y. 10018

MVS - VM - DOS

computer time

201-930-0051
212-921-8855

tbi

TIME BROKERS, INC.

CICS - TSO - CMS

PARALLEL MINISUPER TIMESHARING

Alliant FX/8™

- Eight CE's
- 94.4 MFlops Peak
- UNIX™ System
- Optimizing Fortran
- 16 MB Main Memory

DISCOUNT RATES

PACIFIC-SIERRA RESEARCH/EATON

(916) 621-1600 Thom Taylor

Alliant FX/8 is a trademark of Alliant Computer Systems Corporation

UNIX is a trademark of Bell Laboratories

TAPE/DISK RECOVERY

You know it's there but you can't access it. Our specialty is getting data back for you.

404-438-0033

CREATIVE SYNERGY

ICOTECH

Innovative Computer Techniques
DATA PROCESSING SERVICES
IBM 3081 DEC-10 VAX 8600

- Batch Processing
- Timesharing
- Microfiche
- Public Network Access
- Laser Printing
- Optical Mark Reading

Introducing...
the ICOTECH
Health & Safety
Information System
Route 202 • Raritan, N.J. 08869
201-685-3400 • Contact: Joyce Bogaenko

RENT
TERMINALS
OR
TIME
IN THE
CLASSIFIED
PAGES OF
COMPUTERWORLD

POSITION ANNOUNCEMENTS

SYSTEM PROGRAMMING OPPORTUNITIES

DISCOVER M&I DATA SERVICES...

Leaders in the development of financial data processing systems.

M&I Data Services is in the forefront in the new era of financial data processing with the Marshall & Ilsley Banking Package. Our software is successfully meeting the needs of some of the largest financial institutions in the country. We also provide data processing services for banks and other businesses. We are currently seeking the following data processing professionals:

IMS SYSTEM PROGRAMMER

Individuals with a minimum of 4 years IMS software installation and maintenance experience. Applicants should have a proven history of accomplishment combined with both strong business and technical skills. Supervisory experience preferred.

MVS SYSTEM PROGRAMMER

Candidates should have 2-4 years experience performing MVS/XA system maintenance in a large scale IBM/MVS environment. This position will maintain IBM and vendor products using SMP/E and IBM utilities. They will also be responsible for problem determination and documentation for IBM and vendor products.

M&I Data Services is located in Brown Deer, a suburb of Milwaukee, Wisconsin. Milwaukee is proud to offer an excellent quality-of-life including tremendous recreational opportunities, professional team sports, and a variety of cultural activities.

At M&I Data Services, you may discover the opportunity to utilize your talents in an innovative and challenging environment. We offer a professional work atmosphere, a state-of-the-art technical environment (IBM 3090, MVS/XA, IMS DB/DC, CICS), competitive salaries and a comprehensive benefits package. For immediate consideration, please send your resume, with salary history, to:

Michael C. Singer, Employment Representative
M&I Data Services
770 N. Water Street, BD 80
Milwaukee, WI 53202

Equal Opportunity Employer

M&I Data Services, Inc.

IDMS DATABASE AUDITOR

AVCO AEROSTRUCTURES TEXTRON is a leading manufacturer of aircraft structural assemblies. We are seeking qualified IDMS Database Auditors to meet the expanding needs of our business.

Principal duties will include:

Review of all databases for integrity, security and access methods; Data Dictionary for standards compliance; Database capacity planning and performance; Development of standards and ad-hoc audit reports for upper management use.

Applicants should have B.S. in Computer Science or equivalent work experience and minimum 2 years experience in related work responsibilities. Familiarity with ADSO, ADSA, ADSG, OLQ, CULPRIT, IDB, ASF and IDMS, utilities in an IDMS/R Rel. 10.0 environment a plus. IDMS/R software runs in a CICS/UCF environment in an OS/MVS-XA shop on an IBM 3090-200.

We offer an exceptional compensation benefits package including relocation assistance. For consideration, send resume with salary history in confidence to:

Employment Supervisor-LMH

Avco Aerostructures TEXTRON

P.O. Box 210
Nashville, TN 37202

An Equal Opportunity Employer M/F

POSITION ANNOUNCEMENTS

**DATA PROCESSING
CAREER
PROFESSIONALS**

Are you being evaluated based on performance and merit? Are you enjoying a position with high visibility? If not, then come explore the excellent opportunities at the Arthur Fredric Company. Our continued success has expanded our need for qualified data processing professionals. So if you're looking for performance evaluation, high visibility and the rewards of a successful career, come join us! We offer an excellent salary, along with paid medical, hospital and insurance, plus many more outstanding benefits.

- IDMS/ADSO • IMS/DB
- IMS/DC • ADABAS/NATURAL
- CICS (command or macro)
- OS-COBOL • BAL

If you have the experience we need, call or send your resume to:

THE



5725 N. East River Rd., Suite 375
Chicago, Illinois 60631
(312) 693-3810

An Equal Opportunity Employer M/F

**Sr. Systems
Programmer**

American Edwards Laboratories is a major division of American Hospital Supply Corporation - an international leader in the health care field.

We have an immediate opportunity for a Sr. Systems Programmer to aid in support of a growing and challenging MIS Department in a Sperry 1100/90 environment. This position requires experience in the installation and support of OS-1100 and system software. Experience with problem analysis/resolution and performance analysis required. MASM and COBOL programming experience a plus.

American Edwards Laboratories offers professional challenge complemented by a highly competitive salary/benefits package. Rush your resume and salary history (Note: principals only, please) to: Coleen Bentley, Employment Department, American Edwards Laboratories, Division of American Hospital Supply Corporation, 17221 Red Hill Avenue, Irvine CA USA 92714. We are an equal opportunity employer m/f/h.

American Edwards Laboratories



© 1986 Robert Half International Inc.
Offices independently owned and operated

When you don't have time to find the job you want

Searching for a better job can be a full time job. That's why so many data processors, who want to make a change, don't. Or worse, they take the next job offer that comes along.

If you can relate to this problem, Robert Half-Data Processing may be just perfect for you.

We're sensitive to the problem of the data processing professional, who wants to be fair to the present employer, and at the same time finds it necessary for career advancement to look for another job. Robert Half has been successful at discretely locating the right career positions for data processors—ever since the computer revolution began.

We can help you just as we've helped thousands of other professionals for almost 40 years.

If you must make a change, but can't spare the time for an interview during work hours, just call one of our 100 offices on three continents during a regular work day. Briefly explain your problem to one of our placement professionals, and we'll set up an in-depth phone interview at your convenience—after hours or on the weekend. If it's convenient for you to meet with us, so much the better—we'll arrange the interview.

And if you don't have a current resume, we'll discuss all the pertinent facts with you and compile them for presentation to suitable employers.

Please understand this: Our service is 100% free to you. And, equally as important, we're success oriented. This means our clients only pay our fees when they hire through us. This makes us better. *A lot better.*

So, if you're interested in finding a better data processing job, call one of our nearby offices. A few moments of your time now, may be the beginning of a new and brighter future.

**SYSTEMS PROGRAMMER**

Hamilton Industries, Inc. has a major commitment to expand in the areas of CAD/CAM/CAE Information Systems. If you are an ambitious data processing professional with at least 2 years experience in IBM VM/CMS applications as a systems programmer, we are interested in hearing from you. We have an immediate need for such a candidate in our Technical Services Department.

This position is primarily responsible for developing, implementing and maintaining VM systems, installing and maintaining purchased system utility packages, monitoring and evaluating existing operating systems and subsystems and establishing and maintaining effective channels of communication with areas of data processing.

The preferred candidate will be degreed with emphasis in Computer Science or Information Systems. Previous experience with EXEC, EXEC2 or REXX job control language, programming experience with BAL, and COBOL or Fortran and an advanced level of interpersonal skills is desired. CADAM experience is a plus.

Hamilton Industries, Inc. is a leading manufacturer of laboratory and hospital casework and professional equipment and furniture. Two Rivers is located on the Lake Michigan shoreline, a short distance from Door County. It is an ideal recreational area with much to offer a new professional in the community. We offer an excellent compensation and benefit package including dental insurance, educational assistance, profit sharing, an established wellness program and relocation assistance. For immediate consideration, please send resume and salary history in confidence to:

Manager, Employee Relations

HAMILTON INDUSTRIES

TWO RIVERS WISCONSIN 54241 TELEPHONE 414 793-1121

An equal opportunity/affirmative action employer



**SOFTWARE
SERVICES**
OF FLORIDA INC.

A subsidiary of ROBERT HALF INTERNATIONAL INC.

EXPERTISE PAYS

Paid relocation, excellent benefits and salary commensurate with experience.

- UNIX, C
- RPG III and RPG II
- NATURAL/ADABAS
- COBOL, CICS, VSAM
- COBOL, IMS DB/DC, DB 2 A PLUS
- COBOL EXPERIENCE with McCORMACK & DODGE HUMAN RESOURCES PACKAGE
- FORTRAN or COBOL on HP-1000 or HP-3000

Call toll-free

National:

1-800-237-8181

Florida only:

1-800-282-4141

or send resume to:

Mr. Cy Dougherty, Personnel Director, Software Services of Florida, Inc.

PARAGON CROSSING, SUITE 124, 11300 4TH ST. N., ST. PETERSBURG, FL 33702

POSITION ANNOUNCEMENTS

"We have it in our power to begin the world over again."

— Thomas Paine
American Political Philosopher and Author

You have it in your power to change your world—your career and your lifestyle by contacting TRW's Operations and Support Group in Southern California... where we handle the data needs of 39,000 local TRW employees. Consider the following opportunities:

Senior Systems Programmer

Support the development, installation, maintenance and problem-resolution of Cullinet's IDMS software. Requires expertise in IDMS system parameters and global DMCL's, plus a basic knowledge of IBM MVS software. IDMS distributed system or ACF2 security is beneficial. Requires a BS with 4 years IBM computer systems experience, and 2 years in Cullinet's IDMS software.

System Programmer

Provide routine software to support TRW's central site computer center security implementation. Position requires knowledge of overall security administration requirements, with concentration on MVS system software security methodology. SEE's Access Control Facility (ACF2) software expertise is necessary. Requires a BS with 4 years experience in IBM computer systems, 2 years in software security.

Staff Engineer

Provide technical leadership for 4-6 system programmers in support of IBM disk and tape storage management, security software, catalog management and related software. Current hardware includes an IBM 3090-200 and an IBM 3084Q running in partitioned mode. Requires a BS with 8 years experience in a large mainframe MVS environment, plus administrative, technical writing/analysis and interpersonal skills.

Senior Systems Programmer

Support Storage Media Administration. Involves the development, implementation and maintenance of storage media hardware and related software for the IBM 30XX computer systems. Requires a BS with 6 years experience in related IBM computer positions—4 years in MVS DASD and catalog management. You should have a thorough understanding of IBM's MVS system and assembly language programming, plus experience converting native VSAM catalogs to the Integrated Catalog Facility structure.

Lead Engineer

Automation Equipment Evaluation

Lead the evaluation effort on automation equipment and software, including PC's, networks, network controllers, engineering graphics and communications hardware/software. Requires a BS in CS/EE with at least 10 years hands-on computer systems engineering experience, including micro's, mini's, mainframes, peripherals and software.

System Programmer

Support the installation, testing, implementation and maintenance of IMS software. Requires a BS with 3-5 years experience. You must have working knowledge of MVS, TSO, and IBM utilities. Knowledge of SMP is essential. Exposure to other DBMS products (ADABAS, MIMS) is a plus. Assembly language programming experience is helpful.

TRW offers excellent salaries and benefits including medical/dental/vision care coverage, liberal stock savings program, flexible hours, and a fabulous Southern California lifestyle. Please forward your resume with salary history to: **TRW O&SG, R. Chambers, E1/4029, One Space Park, Redondo Beach, CA 90278.**

Equal Opportunity Employer
U.S. Citizenship Required



MANAGER - M.I.S.

Must possess the capability to operate a System 34 IBM computer, with experience programming in RPG II language, including the maintenance and modification of existing programs. Manufacturing experience with MAPICS background a must.

Successful candidate will interact with all levels of management, reporting to top management. Degree preferred, but not required.

Please send resume with salary history in strictest confidence to:

Box #CW-B4820

Computerworld

P.O. Box 9171

Framingham, MA 01701-9171

An Equal Opportunity Employer

DATA PROCESSING OPPORTUNITIES

1-800-423-5383

Our clients in the SUNBELT and throughout the U.S. have HUNDREDS of current needs

LIFE/70 or LIFE/COMM SYSTEMS PROGRAMMERS	To \$60K
DATA COMMUNICATIONS	\$ OPEN
IDMS, IMS or ADABAS DBA's	To \$64K
P/A (IBM COBOL or ALC)	To \$50K
CONSULTING	To \$40K
TELEPHONY, PBX	\$ OPEN
SOFTWARE ENGINEERS	To \$50K
PMS INSURANCE PKG	To \$45K
	To \$40K

SAUDI ARABIA

P/A, COBOL, CICS, DL/1, MVS To \$54K

Call or send your resume to

ROBERT SHIELDS & ASSOCIATES

P.O. Box 890723, Dept. C
Houston, Texas 77289-0723
In Texas Call: 713/488-7961

IDMS = SUCCESS

IDMS FACT #1

- YOU are an obvious **SUCCESS**, according to your peers & employers **NATIONWIDE**.

IDMS FACT #2

- YOU deserve the best challenges, most diversity, highest salaries, & professional respect.

IDMS FACT #3

- FACT #2 is true because **NATIONWIDE** your IDMS skills are in critical demand among the best environments & corporations.

IDMS FACT #4

- If YOU have 1 YEAR or more of solid IDMS as a Programmer, Analyst or DBA in any environment, industry; WE can offer YOU selective opportunities from the SUNBELT, EAST/WEST COAST, & HEARTLAND USA.

FOR personal consultation: call JIM KRIENEN 513-793-7373 or send resume to:

RIETHMILLER & ASSOCIATES, INC.
Drees Executive Center
7265 Kenwood Road, Suite 273
Cincinnati, OH 45236-4405
Professional-Confidential-Selective

Director of Academic Computing Services

Chicago State University is seeking candidates for the position of Director of Academic Computing Services. The Director manages and supervises the Computing Center, consults with and advises users concerning computer applications, and insures that services are available for instruction and research. Present systems include, PDP 11/44, Apple microcomputers, Cyber 170, IBM 4381, and PLATO. Experience in several computer languages is assumed.

Applicants must hold a Master's degree in Computer Science or equivalent and have at least one year experience in academic computing. Position is available immediately. Send letter of application and resume by September 5, 1986 to:

Dr. William C. Prigge, Dean
Chicago State University
95th Street at King Drive
Chicago, IL 60628

Chicago State University is an equal opportunity, affirmative action employer, and actively solicits applications from women and minority group candidates.

Data Processing Professionals

Software Consultants

Mainframes • Minis • Micros

Current Contract Opportunities in Greater Boston Area

Immediate need:

- DEC VAX COBOL, BASIC, RDB, DBMS, INGRES, MULTIPLE OPENINGS
- DEC - EXPERT SYSTEM - 4GL - PROTOTYPE
- IBM 308X, 4300, COBOL, CICS
- IBM SYSTEM 38, RPG II, MANUFACTURING
- IBM SYSTEM 38, COBOL, CYBORG PAYROLL

If you have 3+ years experience, please contact us. Even if you are busy now, let us work together to plan your next assignment. Opportunities become available every day.

Contact us today.
300 West Main Street
Northboro, MA 01532
(617) 393-7207

PROGRAMMING
SOLUTIONS
INC ... The Right Solution

POSITION ANNOUNCEMENTS

BMC

SOFTWARE

SYSTEMS SOFTWARE PROFESSIONALS

BMC SOFTWARE, one of the fastest-growing IBM mainframe systems software companies, continues to expand its markets aggressively. Our employees enjoy the opportunity to be part of technology's leading edge in a work environment where management recognizes and rewards technical expertise; where productivity and creativity have replaced the coat and tie; where personal and professional growth are priorities; where the company's annual growth continues to surpass its competition.

Please consider the immediate openings now available for SYSTEMS SOFTWARE PROFESSIONALS in our Austin office:

The successful candidates will have:

- 3+ years CICS, TSO
- 3+ years OS/ALC required
- 3+ years MVS
- IMS, DB2

In addition to excellent salaries, generous benefits and a non-smoking environment, BMC in Austin provides the opportunity to live in the beautiful Texas Hill Country, where residents pay no state or local income tax. Qualified applicants may submit resumes with salary histories in strictest confidence to:

BMC SOFTWARE, INC.
8834 Capital of Texas Highway North
Suite 160
Austin, TX 78759

An equal opportunity employer m/f

EMPLOYMENT SERVICE FOR PROGRAMMERS AND ANALYSTS

National Openings With Client Companies and Through Affiliated Agencies

Scientific and commercial applications • Software development and systems programming • Telecommunications • Control systems • Computer engineering • Computer marketing and support.

Call or send resume or rough notes of objectives, salary, location restrictions, education and experience (including computers, models, operating systems and languages) to either one of our locations. Our client companies pay all of our fees. We guide; you decide.

RSVP SERVICES, Dept. C
Suite 700, One Cherry Hill Mall
Cherry Hill, New Jersey 08002
(609) 667-4488

RSVP SERVICES, Dept. C
Suite 201, Dublin Hall
1777 Walton Rd., Blue Bell, PA 19422
(215) 629-0595

From outside New Jersey, call toll-free 800-222-0153

RSVP SERVICES
Employment Agents for Computer Professionals

PROGRAMMER ANALYST II

State of Oregon, Judicial Department, Salem, Oregon

\$1980 - \$2539 Monthly

Perform a variety of technical duties involving systems analysis, programming, and application of information processing technologies. Assist in monitoring and managing a network of system 38's throughout the Oregon court system. Requires a bachelors degree and three years programming experience including one year in a business or government environment. One year experience in COBOL programming. Preference will be given to those applicants with IBM system 38 knowledge.

Submit applications to Kathy Duncan, Technical Services Manager, Supreme Court Building, Salem, OR 97310.

Applications may be submitted through August 31, 1986.

An AA/EEO Employer

Analyst/Programmer - Analyze user requirements and present systems; design, develop, implement and test payroll and personnel applications and systems using IBM 30XX, 43XX, OS/MVS, VSAM, IMS, DB/DC, PL/1, COBOL and APL. Bachelor's degree in Engineering or Computer Science, 2 years experience, 40 hour week, \$43K per year. Mail resume: NYS Job Service, JO #NY8027206, 97-45 Queens Blvd., Rego Park, NY 11374. DOT 012167066.

HIRING?

More computer people read Computerworld than any other newspaper in the United States - more than half a million computer people every week.

And, among our readers at user organizations, about half claim to look at recruitment ads at least every other week (only a small percentage say they never look at recruitment ads).

No wonder Computerworld carries more recruitment ads for computer people than any other publication. To place your ad or to get a rate card with complete details on Computerworld Classifieds, call or write:

Classified Advertising
COMPUTERWORLD
Box 9171
Framingham, MA 01701-9171
1-800-343-6474
617-879-0700

Data Communications Sales Rep

Leading data communications equipment distributor seeks enterprising, established sales representative. Must have own customer base. We provide all essential administrative services: invoicing, receivables, and order processing. We also support with nationwide space and direct mail advertising, "call forwarding" to field locations, equipment warehousing, and technical customer service from our corporate headquarters. Send resume to P.O. Box 367, Ashland, OH 44805.

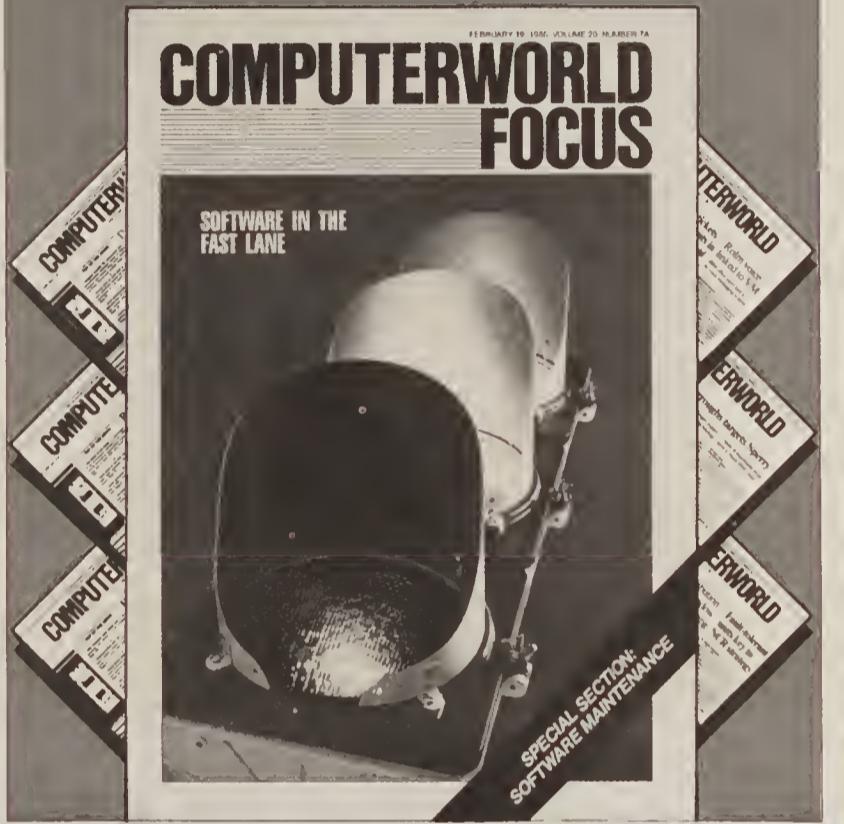
FRINGE BENEFITS!

Collect a big bonus when you subscribe to COMPUTERWORLD — 10 issues of COMPUTERWORLD FOCUS! Each issue deals in-depth with a timely topic: UNIX™, communications, office automation, microcomputing, manufacturing, and more.

COMPUTERWORLD: up-to-the-minute news. COMPUTERWORLD FOCUS: down-to-earth analysis. Get both!

To subscribe, complete the attached order form and mail in this postage-paid envelope. Or call 1-800-544-3712* for faster service.

*In PA call collect 215 768-0388



BUSINESS REPLY MAIL

FIRST CLASS MAIL

PERMIT NO. 55

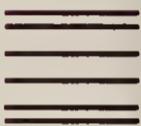
SOUTHEASTERN, PA 19398

POSTAGE WILL BE PAID BY

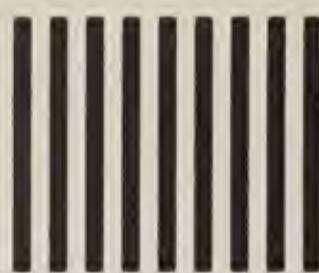
CIRCULATION DEPARTMENT

COMPUTERWORLD

P.O. Box 1016
Southeastern, PA 19398-9984



NO POSTAGE
NECESSARY
IF MAILED
IN THE
UNITED STATES



|||||,|||||,|||||,|||||,|||||,|||||,|||||,|||||,|||||,|||||

POSITION ANNOUNCEMENTS

ENGINEERING

Connect With
The Future

Computer Sciences Corporation, located in Shrewsbury, New Jersey (northern New Jersey shore) has immediate openings for engineering professionals. Qualified candidates must have five plus years' experience and possess a BA/BS degree in Electronic Engineering, Computer Science, Math, Physics or a related degree. We are looking for individuals with specific experience in the following disciplines:

DATA COMMUNICATION ENGINEER

- Data Communications System experience including local and wide area Networks.
- Gateways and Bridges applications in a Data Communications Network.
- HW/SW required for Communications Network

DBMS ENGINEER

- Large-scale distributed Databases/Systems Architecture.
- Software development and distributed architecture including Systems/Application Software.
- Computer Hardware background including Mainframe, Mini, and Microcomputer.

CSC offers competitive salaries and an excellent benefit package. Interested individuals should send their resume and salary history to **Rosemarie Celley**.



COMPUTER SCIENCES CORPORATION

Defense Systems Division

1 North Revmont Drive
Department CW-0818
Shrewsbury, New Jersey 07701

An Equal Opportunity Employer
U.S. Citizenship Required

AUBURN UNIVERSITY DIVISION OF
UNIVERSITY COMPUTING

Project Manager - Administrative Applications

Manages the design, development, and implementation of management information systems, provides direction needed by Analysts and Programmers to develop technical, systems analysis, management, and interpersonal skills; assists in development of data processing standards; and prepares estimates of time and resource requirements for proposed projects. Should be willing to perform analysis and programming tasks on certain projects. Requires a B.S. in accounting, business, or computer-related field and at least four years experience in systems analysis and programming with some supervisory experience. Prefer strong management skills and knowledge of COBOL, EASYTRIEVE, TSO, CICS, MANTIS/TIS.

Systems Analyst

Assists in the development of applications supporting financial and student administration. Requires a B.S. in accounting, business, or computer-related field and at least three years experience in systems analysis/programming. Prefer strong management skills and knowledge of COBOL, EASYTRIEVE, TSO, CICS, MANTIS/TIS.

Microcomputer Specialist

Assists administrators, faculty, staff, and students using the IBM Personal Computer and compatibles. Duties include general consulting, teaching short courses, writing documentation and newsletter articles, and assisting in the application of microcomputers into administrative departments. Requires a B.S., two years' experience, and a knowledge of DOS, word processing, spreadsheets, and database management.

Programmer

Develops applications in support of the University Administration. Requires a B.S. in accounting, business, or computer-related field with working knowledge of at least one programming language. Prefer one year experience and knowledge of COBOL, EASYTRIEVE, TSO, CICS, MANTIS/TIS.

Auburn University is a state-supported land grant university with a broad base of programs in the liberal arts, sciences, and professional areas and a strong commitment to graduate education and research. The main campus has over 19,000 students enrolled and is located near the eastern border of Alabama, just over 100 miles from Atlanta, Georgia.

The closing date for all applications is August 29, 1986. Send a letter indicating the position(s) applied for, a current resume, and the names, addresses, and phone numbers of three references to:

Personnel Selection Committee
Division of University Computing
144 Parker Hall
Auburn, University, AL 36849

Auburn University is an Equal Opportunity Employer.

System Developers
800-231-5920

Inviting resumes from individuals in the more highly technical computer related vocations such as: PHD Computer Scientists, Operating System Developers, Data Base Developers, Porting Specialists, Networks and Telecommunications, Architecture, Artificial Intelligence, Graphics Systems Developers, Microcoders and Firmware Developers, Compiler Development, etc. Special interest in emerging technology such as novel architecture, UNIX, ADA, etc. Similar interest in scientific applications developers including military, process control, data acquisition, telemetry and communications, CAD/CAM, simulation and modeling, etc.—we are a professional employment firm managed by graduate engineers. Fees are paid by the employer. All geographic locations. Send resume or call D.A. Redwine and ask for our free resume workbook & career planner.



Scientific Placement, Inc.

P.O. Box 19949 CW

Houston, TX 77224

713/496-6100

UNIX is a trademark of Bell Labs

CALL THIS NUMBER
AND YOU'VE
COVERED THE WORLD.

**United's MIS Hotline
312/952-7846 or 312/952-4326.**

**Call Collect Monday or Tuesday, August 25 or 26,
Noon-7:00 p.m. Central Time.**

All you have to do is pick up any newspaper—watch any news show—to see how quickly United Airlines is growing.

We're holding on to the number one position in a fiercely competitive industry—because we're the one airline in the industry that is truly committed to advanced information management systems as our primary business tool.

If you have been seeking an environment that offers the most sophisticated approach to business systems development, you can find a whole world of opportunity here. And all it takes is a phone call this week.

CURRENT OPENINGS
IN CHICAGO:APPLICATIONS
DEVELOPMENT
MANAGERS

Qualified candidates will manage project teams of analysts and programmers to develop and implement sophisticated IBM/MVS-based applications using COBOL, CICS and IDMS. The individuals we seek will have demonstrated leadership in the successful planning, development and maintenance of large-scale computer applications. A strong business orientation and solid technical credentials are essential.

PROGRAMMER ANALYSTS/
SR. PROGRAMMER
ANALYSTS

These positions involve technical design, implementation and maintenance of complex computer programs; interacting with users and systems analysts to provide development support. Positions will handle multiple assignments

concurrently and routinely coordinate the work of programming teams. 2-3 years of programming and analysis experience within an IBM/MVS environment with strong COBOL skills essential. Candidates should have working knowledge of structured design/programming and strong analytical and communication skills. CICS/IDMS experience preferred.

SYSTEMS ANALYST

Consult with departments to identify business problems and recommend potential automated solutions. Performs detailed analysis of business process to determine information requirements. Will develop functional specifications and participate in detail system and data base design. Plans, coordinates and monitors project activity. Requires 3 years experience in applications development and system analysis (full life cycle experience). Must be knowledgeable of structured techniques, understand the general business process and possess strong interpersonal and communication skills.

WE WILL CONVINCE YOU!

Talk with our hiring managers and find out where you fit in among one of the nation's most dynamic MIS shops. And don't hesitate to ask about our exceptional compensation plan and the pass/reduced fare air travel privileges that our employees enjoy. Trainees—no calls please, send resumes only.

If unable to call, send a resume in complete confidence this week to: Professional Employment, EXOPX/DF8CW, United Airlines, P.O. Box 66100, Chicago, IL 60666. Equal Opportunity Employer.

UNITED AIRLINES

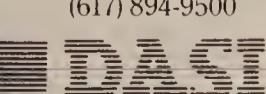
The World Is Looking Up To Us.

EDP
CONSULTANTSImmediate Openings
Northern New England
Ski Country

Northern New England Manufacturer requires a number of consultants with the following backgrounds:

- CICS, DOS, VSE w/VTAM & VM (will support IBM mainframes)
- HP3000—FORTRAN
- WANG VS w/SNA experience

Mention this ad when you call Wayne at:
(617) 894-9500



Data Arts & Sciences, Inc.
Contract Software
Services
13 Riverside Office Park
Weston, MA 02193

DATA PROCESSING OPPORTUNITY IN VIRGINIA

Charlottesville based law publishing subsidiary of Macmillan Inc. is currently expanding its D/P staff. The following opening is available on a team developing an electronic publishing system involving sophisticated data base operations and an elaborate distributed processing network.

D/P TEXT MANAGER

We are seeking a unique individual to fill a newly created position responsible for the successful technical implementation of a state-of-the-art electronic database publishing system. This position requires broad hands-on experience with a large scale IBM mainframe system running MVS, a background in text database systems (preferably INQUIRE), PL/I and CICS. Also highly desirable is experience with 'C', IBM, PC/AT's and photocomposition systems.

This position also requires project management skills including experience with large scale DP projects (\$2M), project methodology, project planning, implementation and tracking and management of project team individuals.

Qualified individuals should possess a Bachelor's Degree or equivalent (MBA considered a plus).

As a subsidiary of Macmillan, Inc., we offer competitive salaries, an excellent fringe benefits package and a high quality of life living area.

Principles only reply with resume including salary requirements to:

THE
MICHEL COMPANY

LAW PUBLISHERS SINCE 1855

Director of Administration
The Michel Company
P.O. Box 7587
Charlottesville, VA 22906
EOE M/F

POSITION ANNOUNCEMENTS

NEW ORLEANS

Spicy! That's the flavor of New Orleans. New Orleans provides its residents an enviable lifestyle. Great restaurants, a warm climate, world renowned celebrations, such as Mardi Gras and the New Orleans Jazz and Heritage Festival, have kept New Orleans the queen city of the south.

But New Orleans is much more than a great place to live, it's a great place to further your Data Processing career. New Orleans is the home of MIDDLE SOUTH SERVICES, INC., the service arm of the MIDDLE SOUTH UTILITIES SYSTEM.

MIDDLE SOUTH SERVICES, INC. is currently involved in several projects including large scale IMS DB/DC systems development. The current hardware environment consists of (3) IBM 3090's, (1) 3083 MVS/XA, 4381 VM/CMS and Tandem.

Analyst/Programmer (Financial) - The position involves analysis and coding of medium to high complex tasks in support of our Property Accounting Management System.

This position requires at least 3 years of experience as an Analyst/Programmer in a large IBM mainframe environment. In addition to working knowledge of OS/JCL, COBOL, IMS/DB; previous experience in supporting financial applications is required. IMS/ADF experience is helpful but not required.

Analyst/Programmer (IMS DB/DC) - The position involves analysis and documentation of system requirements; extension of corporate data base designs to support new applications; development of IMS transactions using the TRANSFORM Applications Generator; design and development of field edit logic; and testing and debugging of IMS online programs. The position requires at least two years of experience in applications development using IMS DB/DC and TSO/ISPF in an MVS environment. Previous experience or training is desirable in the development of decision table specifications; data base design; and requirements analysis.

Data Base Analyst - The position involves designing and implementing physical data bases for in-house developed applications as well as implementing and tuning package applications. The position requires a thorough knowledge of IMS concepts with at least 3 years experience performing DBD, PSB, MFS, ACB gens. Knowledge of IMS utilities including, re-organizations, recovery and SMU II is required.

Middle South Services' relocation package includes: relocation allowance (one month's salary) ... paid moving expenses ... paid house hunting trip ... mortgage interest differential ... plus interim living.

We offer an excellent benefits program and compensation package. For more information contact Joe Hotard or Byron Heath:

1-800-231-4481
In Louisiana call collect
1-504-569-4965
or send resume to:

MIDDLE SOUTH SERVICES, INC.
P.O. Box 61000
New Orleans, LA 70161



MIDDLE SOUTH SERVICES INC.
An Equal Opportunity Employer M/F

Your CIS expertise adds up to total involvement at ESL.

Our environment offers state-of-the-art software development tools as well as stability and unlimited career growth.

Programmer Analysts

IDMS CICS
ADS/O COBOL

In a team setting, you will participate in the entire application development process including analysis, design, coding and implementation. Requires 4+ years programming/analysis experience with batch and on-line mainframe database applications (IDMS preferred) using structured design methodology.

ESL offers excellent compensation and exceptional benefits. Please send resume to Maria O'Connor, Professional Employment Dept. CW-726, ESL, 1345 Crossman Avenue, P.O. Box 3510, Sunnyvale, CA 94088-3510. An equal opportunity employer. U.S. CITIZENSHIP REQUIRED. Principals only, please.

There's a formula for the future.
And it's ESL

ESL
A Subsidiary of TRW

**DEC/VAX MANAGER**

F500 mfr. w/aggressive "factory of the future" project seeks Sr. Analyst/Programmer to manage/support installation of DEC/VAX equipment in IBM data center. Must be self starter, have BA/BS degree & have mgmt. profile. Prefer mfg. bkgd. Limitless career oppy. in beautiful N.Y. Southern Tier. To \$46,000.

ROBERT HALF OF BUFFALO, INC.
420 Main Street
1112 Liberty Building
Buffalo, NY 14202
(716) 842-0801
Personnel Agency

GREATER BOSTON

Boston's thriving economy provides excellent career opportunities for experienced MIS professionals, and Eastern Massachusetts has always offered an outstanding year-round quality of life.

For 20 years ROMAC has been a leader in the placement of MIS professionals.

Contact us today - career opportunities in the \$25-60,000 range.

ROMAC
20 Walnut Street, Dept. C
Wellesley Hills, MA 02181
617-239-0900

Programmer Analyst, Customer Information Control System (CICS), for Cleveland corporate office of retail stores to gather and analyze information for developing and modifying CICS applications. Design and specify systems, and methods for installing, using CICS. Work closely with personnel in problem area to gather information and define system objectives. Document fact-finding and study results. Make formal presentations, recommendations, and specifications in formal reports. Apply current technology to solution of problems. Define system security and control procedures. Requires Master's degree in Computer Science which must have included one course each in Formal Languages (CICS), Compiler Construction, Operating Systems, and Operating System Command Languages. No experience required. 40 hrs/wk. \$542.00/wk. Qualified applicants only send resume with this ad to B. Phillips, JO #3014556, Ohio Bureau of Employment Services, P.O. Box 1618, Columbus, Ohio 43216.

Programmer-Analyst: 40 hours/week, 8:00 a.m. - 5:00 p.m., \$26,776/year. Job requires MS in Computer Science and 1 year experience as Programmer. Job also requires: 1) 2 grad courses in database; 2) 1 grad course in software system development; and 3) 1 grad course in analysis of computer algorithms. Job duties are: based on principles and techniques of database management system, design applications programming for insurance project. Consider user needs. Study existing output/reports to establish new offline claim systems. Design and develop claims offline system using COBOL, IMAGE database language, OUIZ, QTP, and QUERY on Hewlett Packard 3000 computers and IBM (or compatible) PC/XTs. Qualified applicants should send resume and verification of requirements to: 7310 Woodward Ave., Room 415, Detroit, MI 48202. Ref. #49886. Employer Paid Ad.

SYS/38
\$20 - \$50K

Programmers, Senior Programmers, Project Leaders, and Managers needed with RPG III experience. Positions available in the Northeast, Sunbelt, Midwest and Western locations. For more information call Mary collect at (301) 840-0460 or send resume to:

J. Randall Associates
P.O. Box 1521
Rockville, MD 20850
Attn: Mary Friedman

Data Processing

MVS SYSTEMS PROGRAMMER

Hinsdale Hospital is a 440 bed acute care hospital located in the western suburbs of Chicago and we seek a System Programmer with a minimum 2 years experience. Ability to apply System Maintenance using SMP4 and have done I/O and System generations. Exposure to components JES2, ACF/VTAM, ACF/NCP, CICS, IMS/DB desirable. MVS/XA experience a real plus. Excellent salary and benefits. Please submit your resume with salary requirements to:

Bob Warren
120 N. Oak
Hinsdale, Illinois 60521
312/887-2476

PROGRAMMER/ANALYST

- Do you take pride in your work?
- Is excellence important to you?
- Do you want to be recognized for what you do well?
- Do you need to know what you are doing makes a difference?
- Do you have a working knowledge of DIBOL/DEC systems?

If this is you, Alumark, a leading North Carolina building materials manufacturer, needs your talent to help us grow.

WE OFFER:

- Excellent salary
- Advancement potential
- A chance to express your creativity
- Management interested in your personal growth

If your experience includes the DIBOL language and you're ready for a challenging growth position, put your talent to work by calling today for a confidential interview.

CALL: Dr. Hal Hoff or Judy Bailey
Selection Consultants working with the company
PHONE: 800-228-2271
Monday - Wednesday 9:00 a.m. - 6:00 p.m.

**NORTH CAROLINA PROGRAMMER ANALYSTS SYSTEMS ANALYSTS SYSTEMS PROGRAMMERS**

We have 150+ openings with N.C. clients. IBM, HP3000, SYSTEM 38, COBOL, BAL, RPG, CICS, IMS, IDMS, OS/MVS, DOS/VSE.

Fee & relocation paid & excellent salary.

Urgent needs, send resume today, or call collect: Peggy Allen, D.P. Mgr. (919) 288-9330.

Graham & Associates
Employment Consultants
2100-M West Cornwallis Dr.
Greensboro, NC 27408-7095

RESEARCH TRIANGLE OPPORTUNITIES

Currently recruiting experienced computer pros with background in any of the following: IBM Cobol mainframe applications; CICS; IDMS; ADABAS; IMS; Financial, Mfg., Mktg or Sales applications; Banking; McCormack & Dodge package; MSA; AMAPS; MVS, CICS, IMS or NCP/VTAM or DEC/VAX Systems Progs; Capacity Planners; Info Center Analysts; Database Analysts; HP3000; Mfg. Automation; S/38 RPGII/COBOL; DEC FORTRAN Mfg. Partial listing of local, regional & nat'l fee paid positions. Call or write:

The Underwood Group, Inc.
3924 Browning Pl., Suite 7
Raleigh, NC 27609
(919) 782-3024

DIRECTOR**Management Information Systems**

The Duval County Public School System (Jacksonville, FL) is accepting applications for the position of General Director, Management Information Systems. Master's Degree with a Bachelor's Degree in Information Systems preferred; prior experience in the management of a large information processing department desired. Successful applicant should have knowledge of information systems development and Burroughs 7900, DMS 2 and Microcomputers, strong leadership and supervisory ability. Salary range \$29,789 - \$50,104. Send resume to:

Raymond L. Bailey, Director
Certified Personnel
1701 Prudential Drive
Jacksonville, FL 32207

SYSTEMS ANALYST: Work on design of a new data base STARTAC Security Processing System for major NY bank. This system will be a 24-hr, on-line, multi-processing environment w/serial processing occurring concurrently as background on-line svcs. Req design, development & testing of the programs. 4 yrs or 4 yrs rel exp req'd. Must have solid background in COBOL, Assembler, IMS DB/DC, FASTPATH, MVS/XA, structured programming techniques & IBM mainframes. (IBM 3039 will be used.) H.S. grad. \$40,000/yr, 40 hrs/wk. Send resume to: RR-30, ACSIS, Inc., 90 John St, New York, NY 10038.

Get your money's worth. Computerworld will lower your cost-per-hire.

When you're looking to fill MIS/DP positions, there's really only one place you need to advertise. Computerworld.

In every major market, Computerworld reaches more data-processing professionals than the local recruitment media. And we reach them for less. Over 600,000 computer-involved professionals receive Computerworld every week. That's more than any other computer trade journal, business publication, or general-interest magazine.

COMPUTERWORLD**Classified Advertising**

P.O. Box 9171
375 Cochituate Road
Framingham, MA 01701-9171

POSITION ANNOUNCEMENTS

POSITION ANNOUNCEMENTS

COMPUTERWORLD

POSITION ANNOUNCEMENTS

POSITION ANNOUNCEMENTS

POSITION ANNOUNCEMENTS



EDP AUDITOR

The Lockheed Corporation is currently expanding its EDP Audit staff.

We are seeking an exceptional individual with at least 2 years of progressive EDP audit experience, proficiency with audit software, and at least a 4-year degree in Computer Science or a related field. Desirable qualifications include:

- Experience in application auditing and software development
- Familiarity with an IBM micro and mainframe environment (IMS, MVS, VM and ACFII)
- Knowledge of manufacturing and financial systems
- Professional certification (CISA or related).

This position challenges the self-starter while requiring minimal travel. We offer an excellent starting salary plus a comprehensive benefits program. For immediate confidential consideration please forward resume and salary history to:

Lockheed-Georgia Company
Professional Employment
Department 90-31
Marietta, Georgia 30063

Lockheed
-Georgia Company

Giving shape to imagination.

An Equal Opportunity/Affirmative Action Employer



THE IMAGE OF EXCELLENCE IN DIAGNOSTIC HEALTH CARE

At Philips Ultrasound the commitment to excellence is strong. We have made major technological advances in the development of sophisticated medical equipment and have plans to continue this aggressive leadership role in the future.

Right now we are in the process of developing our next generation of ultrasound imaging products and require the following addition to our staff:

Software Development Manager

The selected candidate will be involved in the development of all software for state-of-the-art software imaging systems, have management responsibility for a 12-person software development organization, and interface extensively with marketing and other engineering organizations. Position requires a BSEE or BSCS with some hardware background, a total of 10 years experience with 5 of those years in a management capacity. Technical knowledge should include "C" language programming and real-time Executive, a Top-Down approach to design, plus good project management documentation and communication skills.

As a leading manufacturer of ultrasound equipment we offer the opportunity to work on challenging assignments in a state-of-the-art, high-technology environment. To be considered, please forward your resume and salary history/requirements to **Human Resources, Philips Ultrasound, Inc., 2722 So. Fairview Street, Santa Ana, CA 92704**. Principals only please.

PHILIPS ULTRASOUND, INC. A North American Philips Company

We are an equal opportunity employer m/f/h/v.

PROJECT LEADER - SO. MISSOURI

Dynamic Southern Missouri service organization needs a Project Leader/Supervisor. Will be responsible for supervision of system design and development in a Sperry Univac 1100/900 environment. Will also develop long-range DP goals and plans. Any exposure to packaged software and technical support are big pluses. Salary to \$40,000.

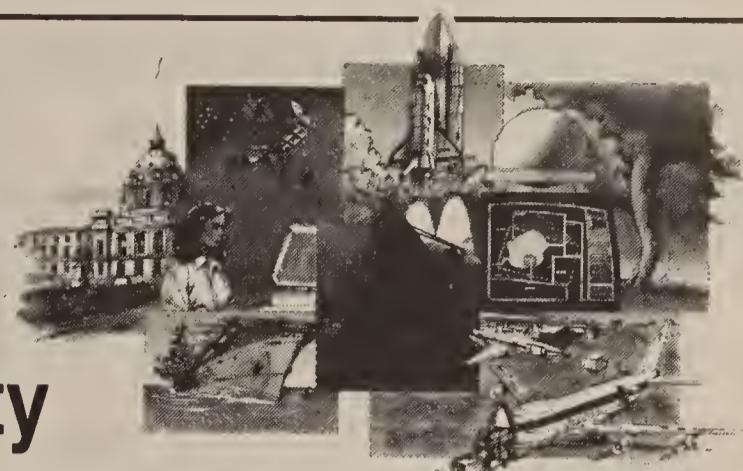
ROBERT HALF
DATA PROCESSING
7733 Forsyth Blvd.
St. Louis, MO 63105
(314) 727-1535

DATA ARCHITECTURE

Successful candidates should have 5-10 years experience including recent high level data systems architecture, data modeling and administration. Background in 2 of the following: macro systems planning, logical data administration and/or data base software development. Excellent starting salary, benefit and relocation package. Please call or send resume to:

Stephen J. Kukoy, President
Abacus Consultants Inc.
1777 S. Harrison, Suite 404
Denver, CO 80210
(303) 759-5064

Discover a World of Software Opportunity



The right career move is not always an easy choice, but the top software professionals today are looking to Sperry for opportunity. Whether through business and communications applications or keeping our nation's defenses combat-ready, Sperry Systems Integration personnel are there, providing customized software solutions to complex data processing problems. With sites in nearly all of the 48 states, positions available afford travel without relocation (per diem) opportunities and permanent opportunities. Permanent positions are available now in the following cities:

• Phoenix, AZ	• Riverdale, MD	• Philadelphia, PA
• Sierra Vista, AZ	• Long Island, NY	• Newport, RI
• Los Angeles, CA	• St. Paul, MN	• Dallas, TX
• San Diego, CA	• Newark, NJ	• Dahlgren, VA
• Aberdeen, MD	• Syracuse, NY	• Springfield, VA
• Lexington Park, MD	• Harrisburg, PA	

Our current opportunities require a BSCS or related degree and a minimum of two years experience in one or more of the following areas:

• O/S 1100 Internals	• Jovial J73
• DMS-1100 Internals	• Ada
• TELCON/DCP Internals	• PE 3200
• MAPPER Internals	• Ultra 16/32
• MAPPER Coordination	• NTDS, ASW or EW Applications
• MAPPER Run Writing	• AN/UYK-7/20/43/44
• DMS/DPS	• MIL-STD-1750A Instruction Set
• UNIX Consultants	• VAX 11/780 with FORTRAN 77
• UNIX Specialists	• VMS Internals
• CMS-2	

You are invited to send your resume with salary history and geographical preference to: Employment, SPERRY Integrated Business Systems, Systems Integration Division, Dept. BRIT 2, 1901 N. Moore Street, Suite 506, Arlington, VA 22209 or call Toll Free (800) 233-7365.

You can also investigate more on career opportunities with Sperry via your personal computer. For complete up-to-date job opportunities, dial 1-612-941-5723, enter the password: **SPERRY SYSTEMS**. Sperry is an Equal Opportunity Employer. U.S. citizenship is required.



SPERRY

©Sperry Corporation 1986

K MART DATA COMMUNICATIONS DESIGN ENGINEER

Key openings exist in one of the world's largest satellite based X.25 data and video network as a Data Communications Design Engineer for K Mart Corporation Communication Support Group located in Troy, Michigan.

The successful applicant must have:

- Degree in Electrical Engineering, Computer Science or equivalent experience.
- At least 5 years experience in design and implementation of complex data network.
- Working knowledge of X.25 packet switching, common carrier facilities, tariffs, distributed data processing, front end processors and microwave/satellite communication.
- Excellent written and oral communication skills.

Salary commensurate with experience. Please send resume to:

Headquarters Personnel
K Mart Corporation
3100 W. Big Beaver Rd.
Troy, Michigan 48084

Equal Opportunity Employer M/F/H

NY METROPOLITAN AREA

IBM

- Data Communications, V.P. level. Knowl network design & implementation. Also X.25 pkg switching. 5 yrs exp.
- MVS IMS Syst Prog'r. CICS a plus. 3-5 yrs exp.

BURROUGHS

- COBOL ALCOL DMSII Prog'r Analyst. 2-5 yrs exp.
- DEC VAX. Banking environment. Applications Prog'r's w/VAX BASIC. 3-5 yrs exp.
- Applications Prog'r's w/knowl COBOL. 3-5 yrs exp.

BROKERAGE

- ANALYST with extensive Brokerage background.

Call 212-398-9891

or submit resume to:

HANK WALSH ASSOCIATES

16 W. 40 St., NY, NY 10018

COMMUNICATIONS & GRAPHICS R & D SOFTWARE ENGINEERS

Salaries to \$70,000

East Coast Location

Our client, a Division of a prestigious Fortune 200 high technology company is seeking talented, creative professionals for their R & D commitments in the fields of Communications, Graphics, Image Processing, Factory Automation, Systems Integration and Information Management.

Multiple growth opportunities exist for U.S. citizens with BA/BS, MS or PhD degrees and experience in one or more of the following:

■ Graphics	■ Image Processing
■ Man-Machine Interface	■ Software Engineering
■ Cartography	■ Operating Systems
■ Scene Analysis	■ Language Theory
■ Communication Software	■ Automation (MAP)
■ LAN's/WAN's	■ Distributed Computing
■ Fiber Optics	■ Broadband/Baseband
■ Voice/Data	■ AI/Expert Systems
■ Token Ring/Token Bus	■ CIM/Robotics
■ Hyperchannel	■ Hyperbus
■ SNA, VTAM, NCP	■ Processor Architecture
■ ISO Protocols	■ IEEE 802 Protocols

Liberal relocation policy and excellent benefits.

To explore these outstanding career advancement opportunities in a leading edge advanced technology environment, send your resume in confidence with current compensation information.

Emil Pieper

WETERRINGS & AGNEW

PROFESSIONAL PLACEMENT CONSULTANTS

1200 Midtown Tower, Rochester, NY 14604 • 716/454-3888

POSITION ANNOUNCEMENTS

PROJECT LEADER

Blue Cross Blue Shield of New Mexico is seeking a Project Leader to head the implementation of a new claims system. The right candidate should possess a minimum of 7 plus years of progressive experience in the highly competitive health care delivery industry.

Requirements are:

- Working knowledge of fee-for-service, PPO and HMO benefit delivery systems; Understand enrollment and membership as required to support claims processing
- Excellent interpersonal and leadership skills
- Ability to communicate technical issues in understandable lay terms in both verbal and written forms
- Technical knowledge of MVS/XA, COBOL, CICS, VSAM and Assembler.

CICS PROGRAMMERS

We are also in search of CICS Programmers for our expanding on-line team. Our CICS network has over 30 hospitals and 7 branch offices throughout New Mexico connected to the system. The operating environment is MVS/XA with TSO/ISPF and VTAM.

Requirements are:

- Minimum of 3 years of progressive experience writing COBOL command level CICS
- Experience using VSAM access methods
- Knowledge of Interest desirable
- Good verbal and written communication skills
- Knowledge of health care a plus.

Located in the sunny Southwestern city of Albuquerque, New Mexico with its numerous cultural as well as recreational activities, Blue Cross Blue Shield of New Mexico offers a competitive compensation package and excellent fringe benefits. If qualified and interested in these opportunities, please send resume to: Senior Recruiter, Blue Cross Blue Shield of New Mexico, 12800 Indian School Road, N.E., Albuquerque, NM 87112.

 Blue Cross
Blue Shield
of New Mexico

An Equal Opportunity / Affirmative Action Employer

...MIDL...MIDL...MID

Judge Us By Our Performance.

■ In our business, it's not always how much you have, but how well you manage it. Just look at MIDLANTIC BANKS INC. We were recently rated #2 in the nation for overall performance by U.S. Banker. For over 150 years, we've been getting better and better. And, in that kind of atmosphere, your performance will be recognized, too. Plus, you'll share in profits and earn a substantial salary for your efforts.

Currently, we seek someone to help us manage as:

Check Processing Project Leader

■ You'll manage 4-6 Programmer/Analysts supporting a multi-site IBM CPCS-3890 installation, develop and implement a regional P.O.D. check processing environment, and enhance our software portfolio. At least 5 years of your experience should be in CPCS and related products, with a total of 8-10 years DP exposure. You should have effectively managed a CPCS support programming team and have a working knowledge of applicable software products.

■ If this sounds like your opportunity to really excel, send us your resume today.

MIDLANTIC NATIONAL BANK, Human Resources Department, Dept. CW/818, 95 Old Short Hills Road, West Orange, New Jersey 07052. We are an equal opportunity employer.

MIDLANTIC

Visiting San Francisco?

Let us know when you are arriving and we may arrange that you stay forever!

DATA PROCESSING PROFESSIONALS skilled in Main Frames, Minis or Micros. Data Base or On-Line Systems. consider a move to the beautiful SAN FRANCISCO BAY AREA.

LOGICAL OPTIONS
Incorporated Agency
One Market Plaza, Spear Tower, Suite #2014A
San Francisco, CA 94105 • (415) 777-3900

PROJECT LEADER To \$40,000

Rapid-growth Twin Cities area firm has exceptional opportunity for systems analyst with strong systems design and data base background. Req's 4 yr degree & IBM/COBOL programming bkgd.

Call Mark David at
(612) 339-9001

ROBERT HALF
DATA PROCESSING
3636 IDS Center
Minneapolis, MN 55402

ASSOCIATE DIRECTOR for SOFTWARE SERVICES Computer Research Center University of New Orleans

The University of New Orleans invites applications and nominations for the position of Associate Director for Software Services, Computer Research Center. This is one of three senior management positions reporting to the Director. The Associate Director is responsible for the User Services and Systems Programming departments. In addition, the Associate Director is involved in long range planning and the other duties typical of a senior position in a computer center.

The University of New Orleans is the second largest university in Louisiana serving 16,500 students from an urban campus next to Lake Pontchartrain. The Computer Research Center, as the central academic computing facility, has four VAX 8600 computers in a cluster configuration and a campus wide Ethernet network with over 500 micro/terminal connections and four general access remote sites. Research computing is growing rapidly and the University is pursuing an order of magnitude increase in computing capabilities.

It is preferred that candidates have an advanced degree in an appropriate field. Candidates should possess excellent communications skills and have proven leadership skills. It is required that candidates have significant work experience with modern mainframe computers.

Applications should include a resume and the names, addresses, and telephone numbers of at least three references. Applications will be received until September 3, 1986 or until the position is filled. Please send to: Dr. Mads Leder, Director, Computer Research Center, University of New Orleans, New Orleans, LA 70148.

The University of New Orleans is an Affirmative Action, Equal Opportunity Employer

PROJECT LEADER

Western United Life Assurance company is a rapidly growing full line life insurance and annuity company. Currently we need a project leader to head a COBOL programming team in the development of new life insurance products. Life insurance and annuity product development with actuaries a must, other insurance background a plus

Hardware IBM 4341
Operating Systems: OS/VS1, VM, CMS, CICS

Spokane is a Metropolitan area of 400,000 people, located in an outdoor recreational area that includes 50 lakes within an hour and several winter ski areas. Spokane is the "Western Gateway to the Rockies" and offers some of the nation's top educational facilities.

Western United offers flexible working hours that enables employees to obtain the maximum enjoyment of the local recreational opportunities within its beautiful natural setting.

We offer competitive financial compensation and relocation assistance.

For consideration, send your resume to:

Kenneth R. Creech
Personnel Manager
Western United
Life Assurance Company
W. 929 Sprague Avenue
Spokane, Washington 99204

PA CONTRACTS TOP RATES

- IDMS ● ADABAS
- DBII ● IMS
- DATACOMM
- CICS ● TANDEM

PAI, a leader in providing full service systems development, seeks employees and/or subcontractors for immediate long term assignments!

Atlanta 404-447-8773
Dallas 214-233-7775
Minn. St. Paul 612-922-1103
Orlando 305-660-1588

PROGRAMMING ALTERNATIVES, INC.
3105 Medlock Bridge Rd.
Norcross, GA 30071

PROGRAMMERS ● ANALYSTS

- TECH SPECIALISTS ● IBM
- NCR ● BURROUGHS ● DEC
- MANUFACTURING
- BANKING
- SERVICE

SOUTHEAST

We provide a professional and confidential service. Absolutely no obligations. Please call or write:
ADKINS AND ASSOCIATES, LIMITED
Executive recruiters for data processing
P.O. Box 16062 • Greensboro, NC 27406
919-378-1261
relocation and fees paid by client companies

NEW ENGLAND**BOSTON DB ANALYST — DEC**

Dynamic mfr. w/solid growth record seeks database pro for internal consulting role. Solid exp. w/ VAX/VMS, DBMS-32 & COBOL req. Oppy. to develop wide range of apps. in leading edge environ. \$38,000.

BOSTON SENIOR P/A — N.H.

This state-of-the-art shop is in tax free NEW HAMPSHIRE & they seek a solid P/A for new proj. Environ. is IBM MVS COBOL CICS DBMS. Oppy. to remain tech. advanced & enjoy laid-back lifestyle. \$33,000.

BOSTON WANG VS COBOL P/A

Prestigious RE/mortgage investment co. seeks take-charge P/A for MIS dept. expansion. COBOL/BASIC w/pkg. modification/installation exp. + OA or PC/VS bkgrd. a plus. New network of VS300's & 100's w/supportive mgmt. Low \$30's.

HARTFORD PROG/ANALYST & SYSTEMS/ANALYSTS

Two + yrs.' of COBOL qualifies for suburban oppy's. in state-of-the-art, growing org. Challenging positions on major non-devel. proj. available. IMS or IDMS exp. a plus — co. will provide training. Excellent growth position. High salaries to \$37,000+.

HARTFORD SYSTEMS MANAGERS

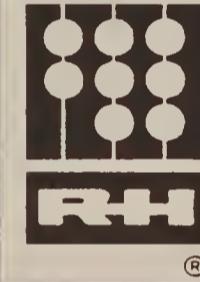
Major fin'l. org. seeks strong mgrs. to lead new proj. in implementing on-line data base systems. Exp. in banking (check processing, DDA, Funds XFER) or in portfolio mgmt. is a plus. Excellent benefits, full relo, sign-on bonus & many extras. Salary to \$60,000+.

PROVIDENCE DATABASE (IMS, IDMS)

Providence investment firm seeks database pro for growth oriented position in design, database architecture & sys. programming. Investigate multiple openings in coastal Rhode Island w/IBM/OS/MVS installations. Full relo. \$45,000.

ROBERT HALF**EDP PERSONNEL SPECIALISTS**

Contact the Manager of any office listed below.



100 Summer St., Boston, MA 02110
(617) 423-1200

111 Pearl St., Hartford, CT 06103
(203) 278-7170

900 Turks Head Bldg., Providence, RI 02903
(401) 274-8700

Client Companies Assume All Fees.

NEW DATA CENTER 100 OPENINGS

Our client one of the most prestigious and technically progressive companies in southern California is in need of top caliber computer professionals to staff its new data center.

APPLICATIONS DEVELOPMENT

IMS DBDC Programmer Analysts
IMS DBDC Systems Analysts
IMS DBDC Project Leaders
Data Base Analysts
Department Managers

SYSTEMS PROGRAMMING

MVS Systems Programmers
IMS Systems Programmers
VTAM/NCP Systems Programmers
Systems Programming Managers

Joe Masters & Associates
2005 Palow Verde Ave.
Suite 239,
Long Beach, CA 90815
213-597-2306

Company needs Systems Analyst - EDP (Senior Systems Analyst). Design, code and maintain batch and online programs required in the conversion of photocomposition data into BRS loadable formats. Develop and maintain program documentation. Develop utility libraries utilized in the reformatting of a variety of photocomposition input and other text material for database loads. Work to insure program quality. Develop individual training program based upon background and organizational objectives. Serve as group leader. Employee uses NAS 90/80 system utilizing IBS MVS operating system, CICS-command level, SPF/TSO, IBS assembler and the Whitesmith C language compiler, an IBM system 36 with text management; a data general MV/10,000 with AOS/VS operating system, INFOS II file management, SQL relational database software and both COBOL and C programming languages. Job requires Masters Degree in Computer Science. Education must include experience with the development and implementation of a text processing system and experience with IBM Assembler in an MVS (multiple variable sessions) operating system, C programming language and Command Level CICS (Customer Interface Communication System), 40 hr/wk. 7:30 a.m. to 4:30 p.m. Salary \$26,787.15 per year. Qualified applicants only send resume to Troy Job Service Office, Attn: Mr. Donald Radley, 1801 Sixth Avenue, Troy, New York 12180. Refer to Job Order #0402040 (D.O.T. 012.167.066).

An equal opportunity, affirmative action employer.

EDUCATION**EXPERIENCE COUNTS! NON-RESIDENTIAL DEGREE PROGRAMS**

Professionals in any field may apply for at-a-distance Bachelor's, Master's or Doctoral degree programs in Management, documenting work experience instead of further classroom, and presenting a career accomplishment project instead of a standard thesis. The cost is moderate, the time for completion is shortened. Designed for working professionals. Program authorized by the California Department of Education Students Worldwide.

CALIFORNIA UNIVERSITY for ADVANCED STUDIES
School of Professional Management
Office of the Dean, Room C-2
100 Galli Drive
Novato, CA 94947 (415) 382-1600

ROMAC

Att: Dept. 2
P.O. Box 7040 DTS
Portland, Maine 04112
(207) 773-4749

"Computerworld's audience delivers the proven professionals that we look for."



Marc Blessing
Director
CompuSearch
Cleveland, Ohio

A division of Management Recruiters International with 172 offices in the U.S., CompuSearch markets itself as the nation's largest recruitment agency devoted exclusively to MIS/DP placement. But it was not always that way, according to Marc Blessing, Director of CompuSearch.

CompuSearch needed to gain industry awareness. "Three years ago the general public and most of the DP industry had never heard of CompuSearch. Prospective clients would often say, 'who?' when our account executives would call," says Marc. "We needed national recognition and we needed a publication that would allow us to zero in on our target audience."

So CompuSearch started advertising in Computerworld. And it worked.

"It worked because of Computerworld's audience," he explains. "We're getting people with diverse backgrounds — from dedicated professionals with 2-3 years of programming experience to top MIS/DP management."

"Computerworld's audience delivers the proven professionals that we look for," Marc reports.

"Because of the new contacts that Computerworld produced on both the client and candidate sides, we decided to increase — actually double — our advertising in 1986," he adds. "We've considered other publications, but we know that our dollars stretch farther with Computerworld. It allows us to hit our target audience," concludes Marc.

Computerworld. We're helping employers and top professionals get together in the computer community. Every week. Just ask Marc.

For all the facts, call Al DeMille, National Sales Manager, at (617) 879-0700.

COMPUTERWORLD

375 Cochituate Road, Box 9171,
Framingham, MA 01701-9171/(617) 879-0700

 A PUBLICATION OF
CW COMMUNICATIONS

Computerworld Sales Offices

Publisher/Vice-President/Donald E. Fagan

VP/Sales/Edward P. Marecki
Manager/Marketing & Sales Operations/Kathy Doyle
COMPUTERWORLD, 375 Cochituate Road, Box 9171,
Framingham, MA 01701-9171
(617) 879-0700

BOSTON SALES OFFICE (617) 879-0700
Northern Regional Manager/Ronald Mastor
District Managers/Michael F. Kelleher, David Peterson,
Bill Cadigan
Account Manager/Shem Driscoll
Sales Assistant/Alice Longley
COMPUTERWORLD, 375 Cochituate Road, Box 9171,
Framingham, MA 01701-9171

CHICAGO SALES OFFICE (312) B27-4433
Midwest Regional Manager/Russ Gerches
District Managers/Kevin McPherson, Lary Craven
Sales Assistant/Kathy Sullivan
COMPUTERWORLD, 2600 South River Road, Suite 304,
Des Plaines, IL 60018

NEW YORK SALES OFFICE (201) 967-1350
Eastern Regional Director/Michael J. Masters
Senior District Manager/Doug Cheney
District Managers/Fred Lo Sapien, Frank Genovese
Sales Assistants/Mary Burke, Sue Larson
COMPUTERWORLD, Paramus Plaza I,
140 Route 17 North, Paramus, NJ 07652

LOS ANGELES SALES OFFICE (714) 261-1230
District Managers/Bernie Hockswender, Carolyn Knox
Western Regional Director/William J. Healey
COMPUTERWORLD, 18004 Sky Park Circle, Suite 255,
Irvine, CA 92714

SAN FRANCISCO SALES OFFICE (415) 421-7330
Western Regional Director/William J. Healey
Senior District Manager/Barry Milone
District Managers/Ernie Chamberlain, Mark V. Glasner,
Account Manager/Diane Fuller
Account Manager, Classified/Nicole Boothman
COMPUTERWORLD, 300 Broadway, Suite 20,
San Francisco, CA 94133

ATLANTA SALES OFFICE (404) 394-0758
District Manager/Jeffrey Melnick
Eastern Regional Director/Michael J. Masters
Sales Assistant/Melissa Christie
COMPUTERWORLD, 1400 Lake Hearn Drive, Suite 330,
Atlanta, GA 30319

DALLAS SALES OFFICE (214) 991-8366
District Manager/Mark V. Glasner
Western Regional Director/William J. Healey
COMPUTERWORLD, 300 Broadway, Suite 20,
San Francisco, CA 94133

CLASSIFIED ADVERTISING (617) 879-0700
National Recruitment Sales Manager/Al DeMille
Recruitment Account Executives/Geoff Dodge,
Derek E. Hultky
COMPUTERWORLD, 375 Cochituate Road, Box 9171,
Framingham, MA 01701-9171

CW INTERNATIONAL MARKETING SERVICES
Managing Director/Frank Cutitta
COMPUTERWORLD, 375 Cochituate Road, Box 9171,
Framingham, MA 01701-9171
(617) 879-0700

COMPUTERWORLD, 1060 Marsh Road
Menlo Park, CA 94025
(415) 328-B064

CW Communications/Inc.

Board Chairman
Patrick J. McGovernPresident
W. Walter BoydExecutive Vice-President
Lee Vidmer

Publisher/Vice-President, Donald E. Fagan. Senior VP-Communication Services, Jack Edmonston.
VP-Sales, Edward P. Marecki. Group VP-Circulation, Margaret Phelan. VP-Finance, William P. Murphy.
Computerworld Headquarters: 375 Cochituate Road, P.O. Box 9171, Framingham, MA 01701-9171
Phone: (617) 879-0700, Telex: 95-1153.

SALES Vice President, Edward P. Marecki. Manager/Marketing & Sales Operations, Kathy Doyle. National Recruitment Sales Manager, Al DeMille. Display Advertising Manager, Anne Hadley. Senior Coordinator, Carolyn Medeiros. Display Advertising, Maureen Carter, George W. Griffin, Joy Forman. Classified Operations Manager, Cynthia Delany.

COMMUNICATION SERVICES Senior Vice-President, Jack Edmonston. Director Research, Kathryn Dinneen. Sales Promotion Director, Liz Johnson.

PRODUCTION Production Director, Peter Holm. Production Manager, Marlene Stibal. Paste-Up Manager, Patricia Gaudette. Typesetting Manager, Carol Polack. Art Director, Tom Monahan.

CIRCULATION Group Vice-President, Margaret Phelan. Circulation Director, Nancy L. Merritt. Corporate Fulfillment Director, Maureen Burke.

CONFERENCE MGT. GROUP President, William R. Leitch.

MIS Corporate Director MIS, Jeff Cordeiro.

Computerworld can be purchased on 35 mm microform through University Microfilm Int., Periodical Entry Dept., 300 Zeeb Rd., Ann Arbor, Mich. 48106.

Phone: (313) 761-4700. Computerworld is indexed: write to Circulation Dept. for subscription information.

Foreign Editorial/ Sales Offices

Argentina: Ruben Argento, Computerworld Argentina, Av. Belgrano 406-Piso 9, CP 1092 Buenos Aires. Phone: 34-5583/5584. Telex: 22644.

Asia: Euan Barty, Asia Computerworld Communications Ltd., 701-4 Kam Chung Bldg., 54 Jaffe Road, Wanchai, Hong Kong. Phone: (05) 8L63238. Telex: 72827 (COMWR HX)

Australia: Alan Power, Computerworld Pty. Ltd., 37-43 Alexander Street, Crows Nest, NSW 2065. Phone: (02) 4395133, Telex: AA74752 COMWOR.

Austria: Dr. Manfred Weiss, CW Publikationen, Verlagsgesellschaft m.b.H., Josefstaedter Strasse 74, A-1080 Wein, Austria, Telex: 115 542 (sch/a).

Brazil: Eric Hippo, Computerworld do Brazil, Rua Pedroso de Moraes 1553, 05419 Sao Paulo, SP Brazil. Phone: 814-9658-212-8750. Telex: 11 32017 (WORD).

Denmark: Preben Engell, Computerworld/Danmark A/S, Torvegade 52, 1400 Copenhagen K, Denmark. Phone: (01) 955 695. Telex: 31566.

France: Axel LeBlois, Computerworld Communications S.A., 185 Avenue Charles De Gaulle, 92200 Neuilly Sur Seine, France. Phone: 747 1272. Telex: 613234 F.

Hungary: Dezso Futasz, SZT Computerworld, P.O. Box 386, Budapest, 1536, Hungary.

Italy: Daniele Comboni, Computer Publishing Group S.R.L., Viale Restelli 5, 20124 Milano. Phone: (02) 688 9773. Telex: 333436 (GEJIT).

Japan: Mr. Shuji Mizuguchi, Computerworld Japan, 7-4 Shintomi 1-Chome, Chuo-ku, Tokyo 104. Phone: (03) 551-3882, Telex: 252-4217 (Computerworld Japan only).

Steven Yamada, Tokyo Representative Corp., Sanshin Kogyo Bldg., 2-10 Kando Jimbocho 3F, Chiyoda-ku, Tokyo 101, Japan. Phone: 230-4117, Telex: J26860 (reps for all CWCI publications except Computerworld Japan).

Mexico: Henry Morales, Computerworld Mexico S.A. de C.V., Oaxaca 21-2, Mexico City 7 D.F. Colonia Roma, 06700 Mexico. Phone: (05) 514-4218. Telex: 177 1300 (ACHAME).

The Netherlands: Wout Berends, CW Communications B.V., van Eeghenstraat 84, 1071 GK

Amsterdam, The Netherlands. Phone: (020) 64 6651. Telex: 18242 (CWCOM NL).

Norway: Mr. Morton Hansen, CW Norge A/S, Hovinveien 43, P.O. Box 2862, Toyen, 0608 Oslo 6, Norway. Phone: (20) 64 77 25. Telex: 76476 9 (CW NOR N).

People's Republic of China: Chen Mingkun, China Computerworld, 74 Lu Gu Gun Road, P.O. Box 750, Beijing 10039, People's Republic of China. Phone: (47) 814 6174. Telex: 222214 (CCW CN).

Spain: Neil Kelley, Computerworld/Espana, Barquillo 21-3 izda, Madrid-4, Spain. Phone: 231 23 85; 231 23 86; 231 23 88. Telex: 47894 (CW E).

Sweden: CW Communications AB, Soda Hamnvagen 22, S-115 41 Stockholm, Sweden. Phone: 46 8 67 91 80. Telex: 14904 9 (NO-VACW).

Switzerland: Gebhard Osterwalder, CW Publikationen AG, Witikonerstrasse no. 15, CH - 8032 Zurich, Switzerland. Phone: (01) 55 10 77. Telex: 816710.

Taiwan: Grace Tang, ACE Media Agency Ltd., Boom 503, 1, Fu Hsin S. Road, Sec. 1, Taipei, 10587, Taiwan, R.O.C. Phone: 751 3636. Telex: 14142 (ACE GROUP). (Representative for all CWCI publications).

United Kingdom: Martin Durham, CW Communications Ltd., 99 Grays Inn Rd., London, WC1 8UT, United Kingdom. Phone: (01) 831-9252, Telex: 262346.

Euan Rose, Bill Dunlop, Barbara Levy, Christine Taylor, Beere Hobson Assoc., 345 Goswell Rd., Islington, London EC1, United Kingdom. Phone: (01) 278 3415. Telex: 311951. (Representatives for CWCI publications).

Venezuela: Kalman von Vajna Nagy, CW Comunicaciones, C.R.L. Torre Maracaibo, Piso 10, Oficina H, Av. Libertador, Caracas, Venezuela. Phone: 72-76-30.

West Germany: Eckhard Utpadel, CW Publikationen GMBH, Friedrichstrasse 31, 8000 München 40, West Germany. Phone: (089) 38172-0. Telex: 5215350.

Advertisers Index

ADR	3
Agile	61
Aluminum Case Company	13
Anderson Jacobson	70
Applied Management	81
ASK	55
AT&T	80-81
Brookvale Associates	62
Businessland.....	111
Bytel	23
Case Communications	50
Cincom Systems	27
Clark Information Technology	40
Codex Corp.	10,12,14
Cognos	10,12,14
Com Networks	52
Compaq Computer	73
Computer Corporation of America	32
CW China.....	49
CW Circulation	51
CW ER/PS	64
CW Focus	90
CW NASA	92-93
CW Recruitment	76
CW Rop Testimonial	69
CW UK	85
CW Venezuela	86
Data General	45
Dataware	35
Duquesne Systems Inc.	20
EMC Corp.	87
Fischer Innis	33
Hewlett-Packard	46-47
H&W	75
IBM	34-35, 88-89
Innovation Data Processing	7
Interface	54
Issco	77

Leading Edge Products	18
Michaels, Ross & Cole Ltd.	79
Microframe	63
Microsoft	29
Mitrol Inc.	70
MTI Systems	15
NCR/ADDS	70,84
NCR	21,56-57
NEC Information Systems	13,82-83
Northern Telecom Inc.	30-31
Novell, Inc.	91
Oracle Corp.	11
Paradyne	26
Radio Shack	65
Realia Inc.	44
Relational Data Base Systems	39
Relational Technology Inc.	22
SAS Institute	19,24-25
Software Engineering of America	9
SETA	80
Southwest Software	49
Syncsort	5
System Center	38
Tandem Computers, Inc.	68
Teknowledge	36
Texas Instruments	78-79
Tone Software Corp.	60,86
Tymnet, Inc.	74
Unilease Computer	28
Universal Data Systems	66
Ven-Tel	112
VM Software	53
Walker Interactive	48
Washington University	62
Westwood Computer	13
Zenith Data Systems	58

This index is provided as an additional service. The publisher does not assume any liability for errors or omissions.

COMPUTER INDUSTRY

Businessland to buy Morris

By Alan Alper

Continuing its acquisition binge, computer retailing giant Businessland, Inc. last week agreed to purchase privately held Morris Decision Systems, Inc., a leading reseller to corporations in the New York metropolitan market.

Under terms of the deal, the purchase price, to be paid in Businessland common stock, will be based on Morris's closing financial statements. A Businessland spokeswoman said several hundred thousand shares of new Businessland stock would be issued to Morris shareholders. The deal is expected to close Sept. 3.

Businessland's proposed acquisition of Morris follows its recent takeover of Kansas City, Mo.-based Amerisource, a 28-outlet chain operating primarily in the Midwest. Earlier this year, the San Jose, Calif., firm attempted to acquire 36-store chain MBI, Inc., of Rockville, Md., but could not come to terms [CW, June 9].

Sought to be acquired

Morris sought to be acquired after recently deciding that it would have difficulty continuing to grow or attracting additional financing due to deteriorating market conditions, Morris President Jim Coane said.

"This was aggravated by price cuts made by all our major suppliers recently," he said. "IBM's moves in April on their workstations also made it difficult for us to add value by building up the hard disk drives."

Coane said Morris had been discussing a business combination with

Businessland for a couple of years. "They embrace the same basic strategy — selling to corporations — that we have executed in the marketplace," he claimed.

Analysts last week said Morris appears to fit nicely with Businessland. "It looks like a fair match," said Seymour Merrin, an analyst with the Gartner Group, Inc. in Stamford, Conn. Merrin founded the Westport, Conn.-based chain Computerworks, Inc., which was acquired by Morris last November.

Reflects ongoing consolidation

The proposed acquisition reflects the ongoing consolidation within the computer retailing business. "The big companies have to get bigger," Merrin said. "They want more clout with their suppliers, and their customers want vendors who have more clout as well."

Coane agreed. "You have to make money on the buy side since it's hard to make any money on the sale side," he explained. "That comes only with purchasing power, which results only from buying in large volume."

The 6-year-old Morris, which operates three computer centers, has annual revenue of approximately \$32 million. Businessland, which operates 99 outlets in 43 metropolitan markets, posted sales of \$404 million in its fiscal year ended June 30.

If the acquisition is finalized, Morris' founder and Chairman, Anthony Morris, will become a corporate vice-president of Businessland, Coane said.

nese manage," White said. "But they were clearly running counter to the trend, and their stock price suffered."

The chip industry clearly has yet to achieve the dramatic turnaround predicted by the SIA at the end of last year. That rebound never materialized because a turnaround must be market driven, and "there has just not been enough demand to warrant an upturn," according to Michael Gross, analyst at Framingham, Mass.-based market research firm International Data Corp.

"There are no meaningful signs of an increase in demand for semiconductors from the computer sector," said W. J. Sanders III, AMD's president and chief executive officer.

Semiconductor manufacturers will continue to record losses during the third quarter of this year, but the fourth quarter could bring a return to profitability, Gross said. An upturn will begin to show through in the first quarter of 1987, as purchases of communications and computer equipment increase.

In a separate statement, Burroughs said a meeting is scheduled to be held Sept. 16 for shareholders to conclude the merger between the two companies.

Each share of Sperry common stock is expected to be exchanged for \$30.60 principal amount of Burroughs 9.75% subordinated debentures and 0.918 of a share of Burroughs Series A convertible preferred stock.

Despite skepticism, disk drive stocks can prove rewarding



ACTIVE ISSUES

Kathy Porteus

Investors are giving Winchester drive companies a raw deal, according to analysts.

In recent weeks, disk drive stocks such as Seagate Technology Corp. (SGAT — 12), Micropolis Corp. (MLIS — 16½), Maxtor Corp. (MXTR — 14¾), Priam Corp. (PRIA — 2½) and Miniscribe Corp. (MINY — 6½) were particularly hard hit owing to negative investor sentiment toward technology.

Jean W. Orr, vice-president with Drexel Burnham Lambert, Inc., says, "Investors feel that component suppliers will be affected by continued sluggish demand for computers regardless of how affected they now seem."

Analysts say some drive companies currently trade below their price/earnings ratios of a year ago, despite improved fundamentals. An oft-cited example is Seagate, which is also recommended by most analysts who follow disk storage firms.

Seagate recently disclosed fourth-quarter and fiscal 1986 results that surpassed expectations. The company reported 1986 earnings of 72 cents per share on revenue of \$460 million vs. last year's per-share earnings of 2 cents on \$215 million in revenue.

"Seagate's margins were fantastic, its business mix showed real improvement, and such good numbers come in the wake of one of the worst slumps ever," says Steven Ossad, an analyst with L. F. Rothschild, Unterberg Towbin.

Yet Seagate is selling "at absolutely no multiple," according to Ossad, who estimates Seagate will earn \$1.25 per share in fiscal 1987. Likewise, Orr says Seagate has been and continues to be a very good value.

Porteus is president of Strand Research Associates, a Centerville, Mass.-based company that provides customized research services for financial and high-tech firms.

She estimates the company will earn \$1.15 to \$1.20 per share in the current fiscal year.

Why hasn't a stock like Seagate responded better to positive company developments?

"Disk drive stocks are always volatile and have been characterized by radical shifts in investor sentiment," Ossad explains. "Right now, nobody wants to believe that some of these companies are doing very well."

James Stone, an analyst with Shearson Lehman Brothers, Inc., laments that "investors do not understand the dynamics of the Winchester drive market." According to Stone, brand loyalty does indeed exist among OEM customers, and the market is still oriented toward product performance, quality and service.

Nevertheless, Stone says, the perception persists that this is a commodity market in which "customers will sell their mothers for a \$5 difference in the price of a drive."

Stone says he believes Micropolis's stock, like Seagate's, is being held down by fear. "Investors are concerned that the industry's deep trouble three years ago could resurface in spite of four or five consecutive quarters of up earnings," he says. Stone estimates Micropolis will earn \$1.75 per share in fiscal 1986, ending Dec. 31.

Both Stone and Ossad describe Priam as a very risky bet based on the company's new 190M-byte drive, which is still in pilot production. The company suffers from a weak core business and the reputation of delivering new products late.

But Ossad recommends purchase of Priam because it is a prudent speculation. Under 3, Priam appears to be selling \$1.00 below book value, according to Ossad, and the company has \$25 million to \$27 million in cash and no debt.

Despite current investor resistance to Winchester drive companies, analysts maintain that the potential for a valuation increase exists. "People will inevitably discover," Ossad says, "that here is a group of stocks that are out of favor and doing much better than anybody really thinks."

Convergent reorganizes, cuts staff

SAN JOSE, Calif. — Confirming recent industry speculation [CW, Aug. 11], Convergent Technologies, Inc. last week announced a major reorganization that included the layoff of 500 of the company's 1,900 employees.

Convergent also reduced top management salaries by 10% in a related cost-cutting move.

The reorganization creates a new unit, Convergent Small Business Services, that will manage Convergent's push into turnkey systems in vertical markets. In the past year, Convergent has acquired or announced its intent to acquire vendors of turnkey sys-

tems in the legal, accounting and dealer and distributor markets.

The existing Convergent Technologies unit will maintain responsibility for the firm's current OEM and value-added reseller business. But President and Chief Executive Officer Paul C. Ely Jr. said Convergent is attempting to diversify away from what he called the grand-slam OEM deals, such as the workstation contract AT&T canceled earlier this year.

Ely called last week's layoffs "a direct result of the steep decline in our sales to AT&T."

— Clinton Wilder

Probst to retire; exec office forms

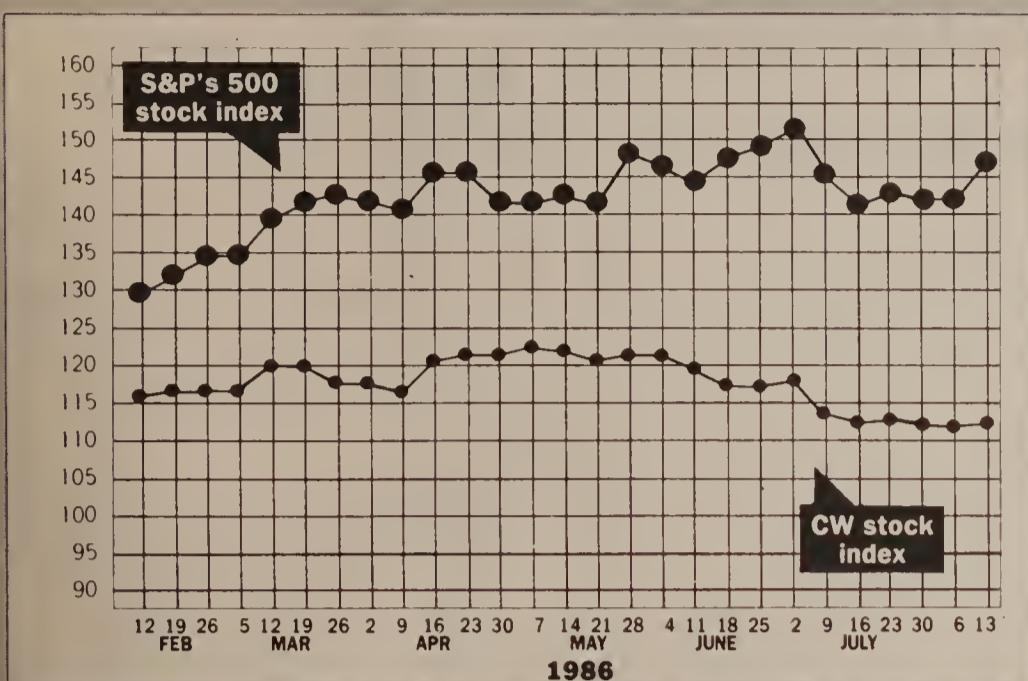
From page 110

cal to users, whether Sperry or Burroughs, that their concerns are addressed. That's why it is important that the new company has a Sperry presence at the top."

COMPUTER INDUSTRY

MITCHELL J. HAYES

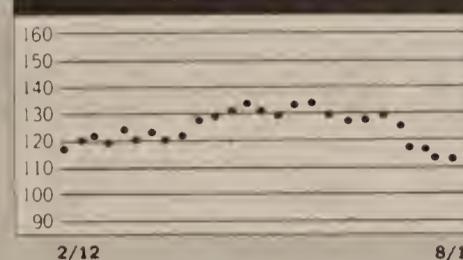
Computerworld stock trading index



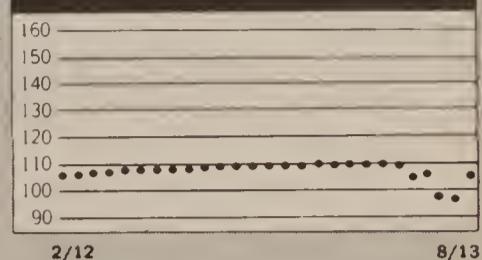
All indexes reflect a historical base of 100 on Dec. 31, 1984, and trace stock market performance in relation to that base. The CW stock index represents the unweighted average performance of the six categories of computer industry stocks.

	8/6/86	8/13/86
Computer systems	111.6	122.0
Software and DP services	97.3	105.1
Peripherals and subsystems	99.3	104.6
Supplies and accessories	143.3	145.5
Semiconductors	81.6	85.6
Leasing companies	93.0	102.0
CW stock index	112.2	113.4
Standard and Poor's 500 stock index	141.6	146.9

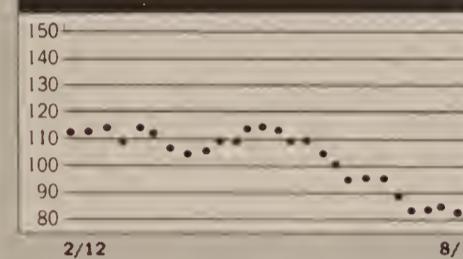
Computer systems



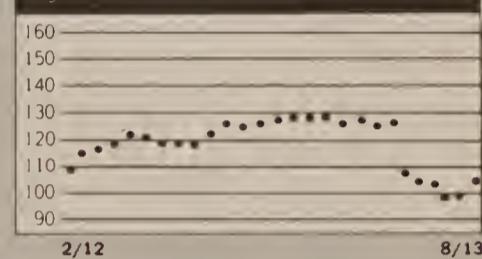
Software and DP services



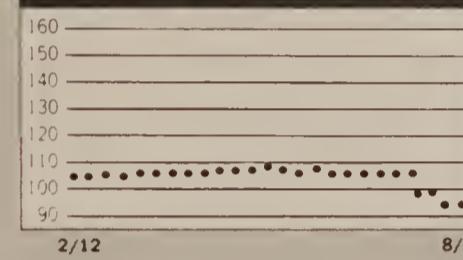
Semiconductors



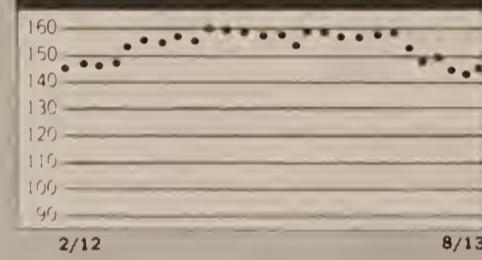
Peripherals and subsystems



Leasing companies



Supplies and accessories



Computerworld stock trading summary

CLOSING PRICES WEDNESDAY, AUGUST 13, 1986

E X C H	PRICE	52-WEEK RANGE (1)	CLOSE AUGUST 13 1986	WEEK NET CHNGE	WEEK PCT CHNGE	E X C H	PRICE	52-WEEK RANGE (1)	CLOSE AUGUST 13 1986	WEEK NET CHNGE	WEEK PCT CHNGE	E X C H	PRICE	52-WEEK RANGE (1)	CLOSE AUGUST 13 1986	WEEK NET CHNGE	WEEK PCT CHNGE
COMPUTER SYSTEMS																	
O ALPHA MICROSYSTEMS	8	4	4.25	-0.3	-5.6	O ADVANCED COMP TECH	7	3	5.13	-0.1	-2.4	A AM INTL INC	9	3	6.25	-0.3	-3.8
O ALTO5 COMPUTER 5YS	19	10	11.38	+0.6	+5.8	N ADVANCED 5YS INC	20	11	15.00	-0.8	-4.8	A ANOERSON JACOBSON INC	3	2	2.25	+0.1	+5.9
A AMO AHL CORP	19	10	17.75	+0.4	+2.2	N AG5 COMPUTERS INC	25	14	18.13	+0.9	+5.1	O AST RESH INC	33	11	10.88	-0.5	-4.4
O APOLLO COMPUTER INC	19	9	12.00	+2.0	+20.0	O AMERICAN MGMT 5YS INC	20	8	17.25	-0.3	-1.4	O AUTOTROL CORP	10	6	7.00	-0.5	-6.7
N AT&T	26	20	23.50	-0.5	-2.1	O ANALYST5 INTL CORP	15	9	12.38	+0.9	+7.6	O AVANT GRADE COMPUTING	9	3	3.25	-0.4	-10.3
N BURROUGHS CORP	72	52	71.25	+4.6	+6.9	O ASHTON TATE	34	10	4.63	-0.1	-2.6	N BANCTEC INC	13	7	7.13	-0.1	-1.7
O CPT CORP	7	4	4.25	+0.0	+0.0	O A5K COMPUTER 5YS INC	15	7	11.00	+0.9	+8.6	N BOLT BERANEK & NEWMAN	48	28	41.88	+2.8	+7.0
N COMPAQ COMPUTER CORP	18	8	14.75	+1.1	+8.3	O ASTRAYNE COMP INC	3	1	1.91	+0.5	+35.5	O CAM8EX CORP	2	1	1.00	+0.0	+0.0
A COMPUTER CONSOLES INC	12	6	8.63	+1.1	+15.0	O AUTOMATIC DATA PROC	39	18	33.25	+3.5	+11.8	N CENTRONICS DATA COMP	8	4	7.88	+0.9	+12.5
O CONCURRENT COMP CORP	25	1	13.25	+1.8	+15.2	O COMPUTER ASSOC INTL INC	25	10	24.25	+1.8	+7.8	A CETEC CORP	9	6	6.25	+0.1	+2.0
O CONTROL DATA CORP OEL	27	15	21.13	+0.3	+1.2	O COMPUTER HORIZONS CORP	15	10	11.13	+1.0	+9.9	A COGNITRONICS CORP	6	3	3.38	-0.3	-8.5
O CONVERGENT TECH	14	6	6.13	-0.1	-2.0	O COMPUTER NETWORK TECH	10	2	6.81	+0.0	+0.0	N COMPUTIGRAPHIC CORP	29	17	17.25	-0.6	-3.5
N CRAY RESH INC	100	44	85.75	+5.0	+6.2	N COMPUTER SCIENCES CORP	40	20	36.00	+1.6	+4.7	N COMPUTERVISION CORP	19	9	12.75	+1.3	+10.9
O DAISY SYS CORP	32	8	9.75	+1.3	+14.7	N COMPUTER TASK GROUP INC	19	12	11.75	+0.0	+0.0	N CONRAC CORP	18	11	15.25	+0.8	+5.2
N DATA GEN CORP	50	30	34.88	+3.4	+10.7	N COMPUTONE SY5 INC	6	1	1.88	+0.0	+0.0	A DATAPRODUCTS CORP	18	11	13.63	+0.3	+1.9
N DATAPORT CORP	9	5	7.50	+0.3	+3.4	O COMSHARE INC	13	9	12.13	-0.1	-1.0	N DATARAM CORP	18	5	9.13	+1.6	+21.7
N DIGITAL EQUIP CORP	98	50	97.38	+7.6	+8.5	N CULLINET SOFTWARE INC	20	8	8.75	+0.9	+11.1	N DATA SWITCH CORP	9	5	6.13	+0.8	+14.0
N ELECTRONIC A550C INC	7	4	4.50	+0.8	+20.0	N CYCARE 5YS INC	17	10	12.00	-0.1	-1.0	O DATUM INC	7	5	5.63	+0.3	+4.7
N FLOATING POINT 5YS INC	46	14	15.63	+1.1	+7.8	N OUQUE5NE 5YS INC	45	11	29.00	+0.5	+1.8	N DECISION INOS CORP	15	9	8.88	-0.1	-1.4
N GOULD INC	38	15	17.88	-1.8	-8.9	N GENERAL ELEC CO	83	56	76.88	+3.4	+4.6	N ENQATA INC	8	3	5.75	+0.4	+7.0
N HARRIS CORP OEL	36	22	27.88	+0.1	+0.5	N GENERAL MTR5 CORP	50	33	41.25	+0.0	+0.0	N EVANS & SUTHERLAND	27	16	21.38	-0.3	-1.2
N HEWLETT PACKARD CO	48	29	42.13	+2.3	+5.6	N GTE CORP	57	38	55.63	+1.0	+1.8	N FLOATING POINT 5YS INC	46	14	15.63	+1.1	+7.8
N HONEYWELL INC	87	59	66.38	+2.5	+3.9	N HOGAN 5YS INC	12	4	10.38	+0.4	+3.8	N GANOALF TECHNOLOGIES	8	5	6.25	+0.1	+2.0
N IBM	162	122	134.00	+2.9	+2.2	N INFORMATION SCIENCES INC	4	1	2.13	-0.4	-15.0	N GENERAL DATACOMM INC	15	8	10.25	+0.9	+9.3
O IPL 5Y5 INC	4	1	3.00	+0.3	+9.1	N INFOTRON 5YS CORP	23	12	12.50	+0.3	+2.0	N HAZELTINE CORP	29	16	17.88	+1.0	+5.9
N ITT CORP	60	32	53.50	+3.1	+6.2	N KEANE INC	18	7	7.50	+0.0	+0.0	N ICOT CORP	13	6	9.00	-0.1	-1.4
N M A COM INC	21	13	14.75	-1.4	-8.5	N LOGICON INC	43	27	27.75	-0.3	-0.9	N INFORMATION INTL INC	18	10	15.50	+0.4	+2.5
N MATUSHITA ELEC INDL LTD	100	49	83.50	+0.9	+1.1	N LOTUS OEV CORP	39	15	35.00	+6.0	+20.7	N INTECOM INC	7	3	4.94	+0.2	+4.0
O MENTOR GRAPHICS CORP	21	11	14.13	+2.8	+24.2	N MICRO PRO INTL CORP	16	8	14.50	+1.4	+10.5	N INTERLEAF INC	15	8	8.13	+0.1	+1.6
N MOOGLAR COMPUTER 5YS	9	6	8.88	+0.0	+0.0	N MICROSOFT CORP	36	26	29.75	+2.0	+7.2	N MEGAQDATA CORP	5	3	2.88	-0.4	-11.5
N MOHAWK DATA SCI CORP	4	1	2.50	+0.6	+33.3	N NATIONAL DATA CORP	26	11	19.50	+1.4	+7.6	A MSI DATA CORP	14	8	10.38	+0.3	+2.5
N N8I INC	16	9	10.00	+0.6	+6.7	N PANOPHIC SY5 INC	36	18	28.13	+1.5	+5.6	N NAUSHUA CORP	28	12	27.13	+1.4	+5.3
N NCR CORP	57	31	54.25	+4.3	+8.5	N PLANNING RE5H CORP	24	14	20.25	+0.0	+0.0	N NETWORK 5YS CORP	26	10	12.50	+0.8</	

COMPUTER INDUSTRY

INSIDE

McCormack & Dodge reorganizes into five autonomous units based on product lines/**86**

Fujitsu begins its first U.S. production of storage products/**88**

Nixdorf's recent \$100 million contract with a major retail chain may signal new hope for foreign software and hardware vendors in the U.S./**90**

Convergent lays off more than 25% of its work force/**108**

INSTANT ANALYSIS

"The onslaught of Asian competitors . . . has irrevocably changed the semiconductor industry. Our world has changed, and to survive, we too must change."

— W. J. Sanders III, president and CEO, Advanced Micro Devices, Inc., on his company's first layoffs since 1974

Chip slump said to be easing despite layoffs, slow orders

By Maura McEnaney

Declining orders and a leading manufacturer's break with a no-layoff policy were grim news for the U.S. semiconductor industry last week. But while news of layoffs would seem to indicate further deepening of the worst slump in the industry's history, analysts say they believe the chip business is inching its way to recovery.

Semiconductor billings for the three-month period ending in July slipped to their lowest point in eight months, according to statistics from the Semiconductor Industry Association (SIA). The SIA's monthly book-to-bill ratio fell to 0.97, marking the first time in six months the indicator dropped below 1.0. The latest book-to-bill ratio indicates that for every \$100 worth of products shipped, manufacturers received \$97 worth of new orders.

"The industry is better off today than it was a year ago," said analyst Edward White of E. F. Hutton & Co. "Orders are up,

and prices are firming. I think we're closer at hand to a general economic improvement in the industry. The book-to-bill is basically a summer lull. There's no chance the book-to-bill will be above 1.0 in August."

Hand in hand with the recent book-to-bill figures came news of 200 layoffs at Advanced Micro Devices, Inc. (AMD), which had been adhering to a no-layoff policy since 1974. Effective last Friday, AMD, citing a "murderous competitive environment," dismissed 200 employees with less than one year's service. Further layoffs could occur after AMD's second-quarter results are reported in October.

In the previous week, Intel Corp. announced the closing of an offshore plant and the layoff of 1,320 workers.

Although the layoffs paint a gloomy picture for an industry that had shown some improvement of late, including a

See CHIP page 108



INDUSTRY INSIGHT
Clinton Wilder

Uneasy truce in chip war

What will benefit more from the recent U.S.-Japan semiconductor trade agreement — the profits of Intel Corp. or the U.S. Senate campaign of Silicon Valley Congressman Ed Zschau?

The question is purposefully cynical. But it stems from the stampede of politicians, from President Ronald Reagan on down, rushing to praise or take credit for the recent pact that purports to end Japanese vendors' alleged chip dumping in the U.S. It certainly makes for good politics, but the potential positive impact for beleaguered U.S. semiconductor vendors remains a huge question mark.

First, a look at the good side. A trade agreement, however superficial it may be, is certainly better than a trade war. If U.S. firms can have a little more confidence in the price stability of memory chips, they can plan future research and development and marketing strategies without the threat of the price slashing nightmare of the past two years.

Part of that confidence may come from the role that Japan's Ministry of International Trade and Industry (MITI) has pledged to play in enforcing the terms of the agreement. But that, too, is a question mark. If push comes to shove, and MITI is called on to research and document Japanese pact violations and enforce penalties, it will be

See UNEASY page 89

Wilder is Computerworld's senior editor, computer industry.

FAA to halt Paradyne purchases

By Mitch Betts

WASHINGTON, D.C. — The Federal Aviation Administration (FAA) last week disclosed that it will not buy additional data communications equipment from Paradyne Corp., the Largo, Fla.-based firm that was suspended from government contracts because of fraud charges.

The FAA, which had obtained an exemption from the governmentwide suspension of purchases from Paradyne, was under increasing pressure from the House Committee on Government Operations and the General Accounting Office (GAO) to stop doing business with Paradyne.

Fred Farrar, a spokesman for the FAA, told *Computerworld* the FAA will not buy any more new equipment from Paradyne, but will purchase equipment that is currently leased from Paradyne in order to

end the relationship.

Miriam K. Frazer, a Paradyne spokeswoman, said the FAA has not officially informed Paradyne of any forthcoming changes in the contract. She added that the firm says it is in the best interests of the FAA and taxpayers for the agency to continue doing business with Paradyne.

A GAO investigation concluded that although it was prudent to continue leasing installed Paradyne equipment to avoid disrupting the air traffic control system, the FAA should not buy more Paradyne equipment in light of the firm's suspension.

Farrar said, "We will not buy any more new equipment from Paradyne, even as options under existing contracts. We will, however, purchase equipment that we now lease from Paradyne, because that

See FAA page 89

Probst to retire; exec office formed for Sperry/Burroughs

By Alan Alper

NEW YORK — Burroughs Corp. last week went a step closer to taking over Sperry Corp. by establishing an executive office to manage the proposed \$10 billion merged company.

In disclosing its new executive lineup, Burroughs revealed that Gerald G. Probst, Sperry's chairman and chief executive officer, would retire at the end of this year.

Probst, 62, is expected to take an unspecified consultant's role and will become a member of the new corporation's International Advisory Board.

The executive office will consist of W. Michael Blumenthal, Burroughs chairman and chief executive officer; Sperry President Joseph J. Kroger; Burroughs President Paul G. Stern; and Burroughs Executive Vice-President James A. Unruh.

Kroger will assume the new title of vice-chairman, handling external operations of the firm's commercial business, including all sales and marketing activities. Stern and Unruh will retain their previous titles, with Stern overseeing day-to-day operations and the firm's government business and Unruh managing corporate staff and planning operations, including finance.

Analysts were not surprised by Probst's intended departure or the makeup of the new corporate suite.

"Blumenthal honored his plan to give one Sperry executive a shot at the top job with a key position," noted Michael Geran, an analyst with E. F. Hutton & Co.

Jay Stevens, an analyst with Dean Witter Reynolds, Inc., said, "It's criti-

See PROBST page 108

DATA VIEW

Second-quarter earnings

Profits are down for a broad range of vendors, but Sterling Software and Harris post gains

Company	Net Income April-June, 1986 (thousands of dollars)	Percent Change From 1985	Revenue April-June, 1986 (thousands of dollars)	Percent Change From 1985
Altos Computer Systems, Inc.	777	-65	28,778	-15
Boole & Babbage, Inc. ¹	244		8,705	+20
Businessland, Inc. ²	896	-18	116,461	+34
Comshare, Inc.	130	-63	16,894	+1
Encore Computer Corp. ³	(2,597)		1,346	+523
Harris Corp.	16,919	+5	577,205	-5
Sterling Software, Inc.	2,154	+262	56,512	+694
Symbolics, Inc.	1,740	-2	31,717	+50
Tandon Corp. ⁴	(20,269)		51,785	-17
Trilogy Ltd. ⁵	(10,865)		6,934	-14

Parentheses indicate loss

¹ Reported loss of \$1.02 million in 1985.

² Results exclude extraordinary tax benefit of \$911,000.

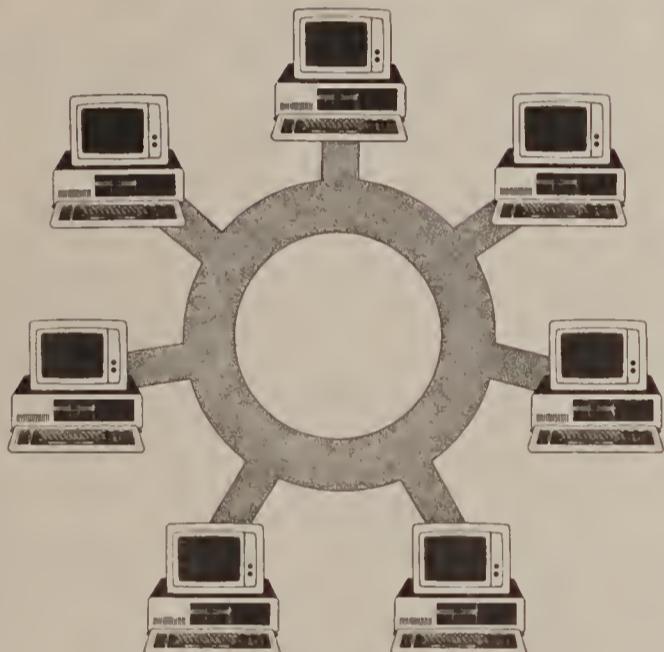
³ Reported loss of \$5.9 million in 1985. Quarter ended July 26.

⁴ Reported loss of \$14.9 million in 1985.

⁵ Reported loss of \$6.1 million in 1985.

Information provided by individual companies.

CHECK OUT THE RING IBM JUST GAVE BUSINESSLAND.



It's the Token Ring network. And IBM® has just given the networking experts at Businessland authorization to carry this long-awaited networking standard.

Which is something not every computer resource can claim.

We'll show you how the IBM Token Ring can network your office PCs. And we'll tell you how networking can improve productivity and save money. By letting your office PCs share information and expensive peripherals.

Plus we'll show you the software and hardware interfaces that work with the Token Ring. Just call (800) 323-1000 for the authorized Businessland center nearest you.

Businessland has already networked over 10,000 workstations. We're the networking experts.

And we've got the Ring to prove it.

BUSINESSLAND®

Where business people are going to buy computers.

Pre-shrunk. Pre-fitted. Pre-thunk.

When you buy a Ven-Tel modem, you buy 12 years of well thought out, innovative technology that's custom-tailored to your needs.

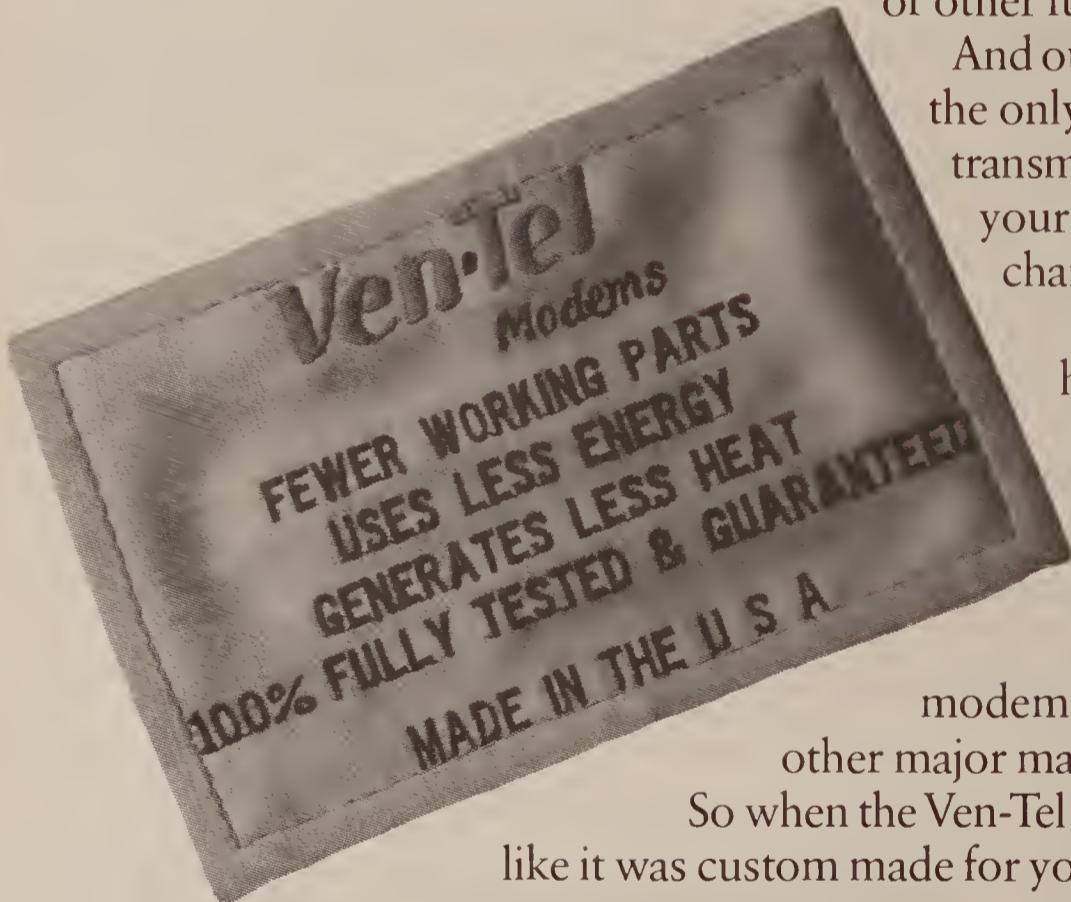
Like the PC Modem Half Card™, the first modem ever shrunk to fit into a short slot, so you'd have another long slot for more memory or other functions.

And our "pre-fitted" 2400 baud modem—the only 2400 that lets you double your transmission speed *without* reconfiguring your PC, buying new software or changing switches.

Another thing: other modems have 300 or so working components, ours have 70. That means they use less energy and generate less heat—the main cause of PC malfunctions.

Even so, we back every Ven-Tel modem with a free *five-year* warranty. No other major manufacturer even comes close.

So when the Ven-Tel modem you buy off the shelf seems like it was custom made for your office, don't be surprised. It was.



Ven-Tel Modems

Our free 24-page booklet, "How To Select The Correct Modem," contains specific information about our full line of modems. To request your copy, call 800-538-5121. In California, call 408-727-5721.